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State Board of Administration of Florida
Foreign Exchange Analysis

MERCER

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Introduction

Scope

The State Board of Administration of Florida (SBA) engaged the Mercer Sentinel® Group (Mercer Sentinel) to benchmark its thirty-seven global and international investment managers' foreign exchange (FX) execution. These thirty-seven managers represent those strategies managed as separate accounts, each of which is custodied with BNY Mellon. The analysis does not consider SBA's foreign currency exposure through its commingled investment accounts, which represented approximately 22% (as of 30 June 2010) of SBA's total international and global equity assets. This study examines data for the 59-month period 1 July 2005 to 31 May 2010. In this analysis, Mercer Sentinel estimates SBA's total FX execution costs, assesses overall trading patterns, and identifies potential issues for further consideration and discussion.

Sources

SBA's custodian, BNY Mellon, provided the FX execution records. Mercer Sentinel has checked the data, but we cannot verify the data accuracy or completeness, as we have no means for verifying what should have been provided. The analysis in this report presumes the data is correct.

BNY Mellon did not provide time-stamped transaction data. Absent time-stamped data, benchmarking relies on evaluating execution performance based on the intra-day trading range of the currencies traded, the price at which each trade was executed, and the volume of each trade executed. We used Bloomberg as the primary market data source. Bloomberg is widely accepted in the foreign exchange market as an accurate and reliable pricing information source. Within Bloomberg, we use the BGN FX rate, which has been algorithmically filtered, as opposed to the composite FX rate (ALLQ), which is an unfiltered composite from all contributing dealers. In our experience and estimation, approximately 2% of valid trades fall outside the day's range as reported by BGN. A significant variance greater than 2% of transactions would indicate a potential problem.

Methodology

In April 2007, Mercer Sentinel acquired rights to software and methodologies originally developed by Record Currency Management Limited, a UK-based currency manager. Since then, Mercer Sentinel has continued to advance the tools and analytical approach supporting this intellectual capital.

As BNY Mellon did not provide time-stamped trade data, our analysis evaluates individual trades against the mid-price for the day, and then uses statistical principles to aggregate those individual results into meaningful cumulative results. A fundamental assumption underlying our analysis methodology is that foreign currency trades are normally distributed around the mid-price for the day.[1] "Mid-price" is defined as the average of the recorded high and low prices.

Mercer Sentinel analyzes trades according to trade size, direction (buys and sells), currency pairs, and SBA's execution sources or contract types. SBA's data has sufficient observations to draw statistically significant conclusions for all commonly used ways of assessing the data. Some exotic currency pairs lack meaningful sample sizes; however, these pairs do not comprise a significant portion of SBA's trading activity.

Trade size

Mercer Sentinel allocates trades into three size groups, as shown in Table 1.1.

Table 1.1 Trade sizes

Category	Trade value
Market	$500,000 or greater
Non-market	$150,000 to $500,000
Micro	Less than $150,000

Trading direction

In this analysis, activity vis-à-vis the US dollar determines trade direction. Buys are trades purchasing US dollars and sell trades are the opposite. Cross trades occur when the transaction does not involve US dollars, such as a Euro to British pound sterling trade. Mercer Sentinel evaluates cross trades separately from buys and sells. Where we identify notable items with cross trades, we highlight them separately.

Currency pairs

Mercer Sentinel classifies the primary global currencies as reserve currencies, and transactions in those currencies as reserve trades. The global reserve currencies are those held in significant quantities by many governments and institutions as part of their foreign exchange reserves. The following are reserve currencies:

[1] Appendix A provides greater detail on our execution analysis methodology.

- Euro (EUR)
- US dollar (USD)
- British pound sterling (GBP)
- Japanese yen (JPY)
- Canadian dollar (CAD)
- Swiss franc (CHF)

All other currencies are classified as secondary. Any trade involving a reserve currency and a secondary currency is put into the secondary currency category.

Settlement period

Mercer Sentinel analyzes and reports spot and forward FX executions separately. Based on market convention, Mercer Sentinel considers FX executions settling within three trading days of the execution date as spot executions, and those settling four days or later as forward executions. We analyze spot executions against the day range on trade date and forward executions against interpolated near-term contracts. For example, we interpolate a ten-day forward contract using a one-week and a two-week standard, near-term contract.

Contract type

SBA's investment managers instruct FX execution through internal BNY Mellon treasury desks or external trading desks. Specifically, the data has seven contract types that we analyzed:

Internal contract types:

Non-negotiated

- CIBC Mellon (C)
- London treasury (N)
- Pittsburgh treasury (T)
- Sub-custodian (I)

Negotiated

- London treasury (L)
- Pittsburgh treasury (X)

External contract types:

Negotiated

- External broker (E)

Graphic presentation

Mercer Sentinel presents the activity within various categories by plotting execution results on a chart. We show the investment managers' actual execution results using dark blue bars. For each data sample or category, we show the investment managers' activity twice: once by number of executions and once by value of executions.

The X-axis represents the percentage deviation from the day's average price relative to that day's posted trading range. Observations greater than 100% or less than -100% on the X-axis represent trades executed outside the day's posted trading range. We expect for any dealer market a small portion of trades to fall outside the day's posted range, as dealers may not post all executions or the data provider may remove various executions for validity reasons.

The light blue line presents a normal distribution curve, representing our expectation of results for each category. We assume a constant variance across all categories, allowing us to provide an approximate depiction of the expected outcome distribution of the underlying data for that specific sample. Therefore, this normal distribution curve does not necessarily represent market nuances among different categories, such as market and micro sized executions or among different currency pairs.

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Summary

Over the examination period, SBA realized total excess costs of about $22.1 million, or about 3.5 basis points, from spot and forward FX executions. Spot executions, which represent about 80% of traded value, accounted for $21.6 million of the total expense. Forward execution costs over the five-year period were modest, incurring only $519,000 of expense, or less than one-half basis point of traded value. Given that our analytical process allows for a 'normal' prevailing spread in each currency pair, in our opinion, the forward results are acceptable but the spot results are more costly than warranted.

SBA's total spot and forward FX cost results are better than or consistent with observations for most other large institutional investors in our experience. However, there are areas within SBA's FX program that have potential for worthwhile improvement. For example, we believe SBA may be able to achieve better prospective results for its non-negotiated executions by expanding its investment manager supervision and through negotiation with BNY Mellon. Although SBA's non-negotiated execution results are consistent with market practices we have observed in the past, these practices are opaque and expensive.

Spot FX transactions executed with SBA's custodian, BNY Mellon, had excess costs of about $27.7 million, or about 10.4 basis points. In contrast, spot transactions executed away from BNY Mellon had an excess benefit of about $6.1 million, or 2.6 basis points. Forward FX executions by BNY Mellon had excess costs of about $928,000, or 4.4 basis points; forward FX execution by third parties had excess benefit of about $408,000, or 0.4 basis points. We recommend that SBA review these results with BNY Mellon. While the external spot and forward executions were more than satisfactory, the standing-instruction internal executions

were expensive. In particular, the vast majority of the excess cost ($26.8 million, or 25.8 basis points) is associated with internal, non-negotiated executions (contracts N and T).

BNY Mellon executed (through internal negotiated and non-negotiated contract types) approximately 9% of total spot trades (by number) outside the day's traded range and 8% of total forward trades (by number) outside the day's traded range. Executing trades at prices outside the day's trading range can indicate poor execution controls. Mercer Sentinel recommends SBA review these out-of-range executions with BNY Mellon. The continued presence of outlier executions, which is consistent for each year's results, represents a persistent problematic pattern and may indicate loose execution controls.

Table 2.1 Aggregate execution profile – spot vs. forward

	Trades		% disadvantageous by value				Excess (cost) / benefit	
	Volume in # of trades	Volume in USD (000's)	Total	Market	Non-market	Micro	USD (000's)	Bps of traded value
Spot	96,308	50,377,952	54%	52%	61%	66%	(21,578)	(4.3)
Forward	5,910	12,789,201	48%	48%	57%	59%	(519)	(0.4)
Total	***102,218***	***63,167,153***	***53%***	***51%***	***60%***	***65%***	***(22,098)***	***(3.5)***

External spot executions, which are those executed away from BNY Mellon, represented about 26% of total spot executions by number and about 47% by traded volume. SBA's investment managers used external brokers (by number of total executions) less than half the time.[2] For forwards, external brokers realized an excess benefit of about $408,000, or about 0.4 basis points.

External brokers executed less than 2% of total spot trades outside the day's traded range: Table 2.2 below indicates that significant amounts of out-of-range executions are not intrinsic to FX trading.

[2] External broker use by total number of trades: 42% (2005); 34% (2006); 30% (2007); 21% (2008); 19% (2009); 32% (2010).

Table 2.2 Internal versus external execution outside the day's range by frequency[3]

	2005	2006	2007	2008	2009	2010
Internal (C, N, T, L, X, I)	11%	13%	10%	7%	8%	10%
External (E)	2%	2%	2%	1%	3%	1%
Total	***7%***	***9%***	***8%***	***6%***	***7%***	***7%***

Table 2.3, which considers executions by contract type, shows that:

- 74% of the volume traded was competitively negotiated at rates representing a net benefit to SBA. These trades were executed via third parties or the custodian's capital markets desks.
- 5% of the volume traded was executed using BNY Mellon's sub-custodian network. Generally, these executions represented trades in "restricted" currencies that have a potential for higher costs.
- 21% of the volume traded was executed through the BNY Mellon Custody Management System on a standing instructions, non-negotiated basis. These executions are the primary source of excess costs in SBA's FX program.

Table 2.3 Aggregate spot execution by contract type

Contract	Trades		Excess (cost) / benefit		Percent of Total		
By Type	Volume in # of trades	Volume in USD (000s)	USD (000s)	Bps of traded value	# of Trades	Volume in USD (000s)	Contribution
C	2	2,247	(6)	(25.3)	0.0%	0.0%	0.0%
N	285	10,331	(165)	(159.4)	0.3%	0.0%	0.8%
T	43,475	10,372,186	(26,612)	(25.7)	45.1%	20.6%	123.3%
Non-negotiated	*43,762*	*10,384,764*	*(26,783)*	*(25.8)*	*45.4%*	*20.6%*	*124.1%*

[3] Years 2005 and 2010 are partial years; specifically, 2005 covers from 1 July 2005 and 2010 covers until 31 May 2010.

Contract	Trades		Excess (cost) / benefit		Percent of Total		
By Type	Volume in # of trades	Volume in USD (000s)	USD (000s)	Bps of traded value	# of Trades	Volume in USD (000s)	Contribution
L	3,597	3,382,863	486	1.4	3.7%	6.7%	(2.3%)
X	19,925	10,514,317	(216)	(0.2)	20.7%	20.9%	1.0%
E	24,652	23,650,021	6,133	2.6	25.6%	46.9%	(28.4%)
Negotiated	*48,174*	*37,547,201*	*6,403*	*1.7*	*50.0%*	*74.5%*	*(29.7%)*
I	4,372	2,445,987	(1,198)	(4.9)	4.5%	4.9%	5.6%
Sub-custodian	*4,372*	*2,445,987*	*(1,198)*	*(4.9)*	*4.5%*	*4.9%*	*5.6%*
Total	***96,308***	***50,377,952***	***(21,578)***	***(4.3)***	***100.0%***	***100.0%***	***100.0%***

Contract type

FX spot transactions executed with BNY Mellon as trading broker (contract types C, I, N, T, L and X), realized an excess cost of $27.7 million, or 10.4 basis points. In contrast, FX spot transactions executed away from BNY Mellon as trading broker realized an excess benefit of $6.1 million, or 2.6 basis points.

With the exception of restricted currencies, SBA's investment managers can choose to execute FX trades with BNY Mellon or with any external broker. Contract types C, N and T represent non-negotiated executions, in which the investment manager accepts the custodian's discretion regarding the FX rate. Non-negotiated trades had an excess cost of 25.8 basis points, or $26.8 million. Contract types L and X represent negotiated rates executed through the custodian's capital markets desk, in which the investment manager maintains discretion over FX rates. Negotiated rates realized an excess benefit of 0.2 basis points, or about $270,000. Contract type I executions are non-negotiated rates that require local market derived rates due to market or government restrictions. These rates represent mostly secondary currencies and most of SBA's restricted currencies. Overall, BNY Mellon's sub-custodians executed trades as expected for secondary currencies, costing 4.9 basis points, or about $1.2 million. We consider all external brokers as having negotiated rates, regardless of whether the investment manager actively negotiates or passively accepts the external rates offered. Overall, external brokers executed trades with an excess benefit of 2.6 basis points, or $6.1 million.

SBA's investment managers used contract type T, or non-negotiated executions with BNY Mellon's Pittsburgh trading desk, more frequently than any other contract type, which realized 25.7 basis points of excess cost. Two-thirds of contract type T executions were micro-sized trades, and are likely auto-repatriation actions. Auto-repatriation is the process whereby dividends and interest payments are converted automatically to the base currency, US dollars, according to standing instructions. SBA should speak with BNY Mellon about its auto-repatriation controls; further, SBA may wish to require BNY Mellon to price auto-repatriation executions against a standard market-fixing rate.

Table 2.4 Aggregate execution profile by contract type

Contract	Trades		% disadvantageous by value				Excess (cost) / benefit	
By Type	Volume in # of trades	Volume in USD (000's)	Total	Market	Non-market	Micro	USD (000's)	Bps of traded value
C	2	2,247	89%	100%	0%	n/a	(6)	(25.3)
N	285	10,331	83%	100%	75%	70%	(165)	(159.4)
T	43,475	10,372,186	76%	73%	80%	85%	(26,612)	(25.7)
Non-negotiated	*43,762*	*10,384,763*	*76%*	*73%*	*80%*	*85%*	*(26,783)*	*(25.8)*
L	3,597	3,382,863	50%	50%	46%	50%	486	1.4
X	19,925	10,514,317	50%	50%	49%	45%	(216)	(0.2)
Negotiated	*23,522*	*13,897,180*	*50%*	*50%*	*49%*	*46%*	*270*	*0.2*
I	4,372	2,445,987	55%	54%	61%	68%	(1,198)	(4.9)
Sub-custodian	*4,372*	*2,445,987*	*55%*	*54%*	*61%*	*67%*	*(1,198)*	*(4.9)*
All Internal	***71,656***	***26,727,930***	***61%***	***58%***	***67%***	***71%***	***(27,711)***	***(10.4)***
E	24,652	23,650,021	47%	47%	46%	46%	6,133	2.6
External	***24,652***	***23,650,021***	***47%***	***47%***	***46%***	***46%***	***6,133***	***2.6***
Total	***96,308***	***50,377,952***	***54%***	***52%***	***61%***	***66%***	***(21,578)***	***(4.3)***

Trading period

SBA's investment managers executed spot trades at an overall cost. Trading years 2008 and 2009 represent more than half of the total executions for all years reviewed and had the highest overall costs to SBA. In these years, SBA investment managers used BNY Mellon to execute 79% and 81% of all spot executions by number – the highest internal rate of all years reviewed.

Table 2.5 Aggregate spot execution profile by year

Year[4]	Trades		% disadvantageous by value				Excess (cost) / benefit	
	Volume in # of trades	Volume in USD (000's)	Total	Market	Non-market	Micro	USD (000's)	Bps of traded value
2005	4,831	3,079,284	55%	56%	53%	59%	(1,183)	(3.8)
2006	11,221	7,385,498	54%	53%	55%	62%	(1,835)	(2.5)
2007	13,480	9,063,731	50%	48%	57%	67%	(634)	(0.7)
2008	26,614	14,705,695	55%	53%	63%	65%	(7,924)	(5.4)
2009	30,150	12,110,546	57%	54%	65%	68%	(10,013)	(8.3)
2010	10,012	4,033,197	52%	50%	58%	62%	11	0.0
Total	***96,308***	***50,377,952***	***54%***	***52%***	***61%***	***66%***	***(21,578)***	***(4.3)***

Trade size

SBA's investment managers executed approximately $50.4 billion in spot executions during the review period at an excess cost of 4.3 basis points, which we regard as more costly than warranted. Market-sized executions, which represent $41.6 billion, or about 83% of total volume traded but only 22% by number, realized an excess cost of $10.7 million, or 2.6 basis points. Eight-percent of market trades were outside the day's trading range; BNY Mellon internal contract types accounted for about 92% of the 1,600+ trades outside the day's range for market-sized trades.

[4] Years 2005 and 2010 are partial years; specifically, 2005 covers from 1 July 2005 and 2010 covers until 31 May 2010.

Micro-trades, which accounted for $4.1 million in total costs and 54% of spot trades by number, were problematic. While only 6% of micro-trades were outside the day's trading range, micro-trades accumulated more than 16 basis points of excess cost. BNY Mellon internal contract types accounted for about 95% of the 3,300+ trades outside the day's range for micro-sized trades. Mercer Sentinel expects BNY Mellon to execute nearly 100% of trades within the day's posted market prices, regardless of trade size.

Currency pairs

As shown in Table 2.5, SBA received unfavorable execution in most currency pairs. Generally, currency pairs with a greater percentage of external contract types had more favorable executions. Reserve currency pairs (those executions with reserve currencies on both sides of the execution) incurred excess costs of 2.4 basis points; secondary currency pairs incurred excess costs of 8.0 basis points. These excess costs are higher than expected for both reserve and secondary currencies.

Reserve transactions had about 1% of executions outside the day's trading range, which is consistent with expectations. However, secondary currencies had about 17% of executions outside the day's trading range, which is excessive. BNY Mellon executed about 76% of secondary executions for SBA by number, and about 69% by total value traded. Based on normal industry reporting practices, we expect about 2% of trades to appear outside the day's trading range for any currency pair. Dealers do not always report execution prices or volumes, and therefore an otherwise "good" trade may appear outside a vendor's daily range. Also, data reporting providers, such as Bloomberg, algorithmically eliminate outliers so that their reported day range reflects general market trading activity. However, with such a large percentage of secondary currency trades outside the day's range, SBA may wish to discuss this execution trend with BNY Mellon, as nearly all executions should be within the day's posted trading range, regardless of currency pair.

Table 2.6 Aggregate execution profile – reserve vs. secondary currencies

	Trades		% disadvantageous by value				Excess (cost) / benefit	
	Volume in # of trades	Volume in USD (000's)	Total	Market	Non-market	Micro	USD (000's)	Bps of traded value
Reserve	60,753	33,379,201	52%	50%	61%	67%	(8,053)	(2.4)
Secondary	35,555	16,998,751	58%	57%	60%	63%	(13,525)	(8.0)
Total	***96,308***	***50,377,952***	***54%***	***52%***	***61%***	***66%***	***(21,578)***	***(4.3)***

Forward executions

Forward executions realized about $519,000, or about 0.4 basis points, of excess cost. Consistent with spot trades, internal contract types contributed excess costs: about $928,000, or 4.4 basis points. External contract types contributed excess benefits of about $408,000, or 0.4 basis points. External trading brokers transacted 98% of executions within the day's trading range, but only 92% of BNY Mellon's forward executions were inside the day's trading range, suggesting BNY Mellon lacks effective forward execution forward controls.

3

Contract type analysis

Internal trade execution

Overall, BNY Mellon's internal executions incurred approximately $27.7 million in excess costs. Execution orders placed directly with BNY Mellon's capital markets desks ("negotiated", contract types L and X) resulted in approximately $270,000 of excess benefit. Sub-custodian executions (contract type I) and non-negotiated executions (contract types C, N, and T) were less favorable. Subcustodian executions resulted in about $1.2 million of excess costs. Non-negotiated executions realized about 25.8 basis points of excess cost, or about $26.8 million.

Table 3.1 Aggregate execution profiles for BNY Mellon only

	Trades		% disadvantageous by value				Excess (cost) / benefit	
	Volume in # of trades	Volume in USD (000's)	Total	Market	Non-market	Micro	USD (000's)	Bps of traded value
Non-Negotiated	43,762	10,384,763	76%	73%	80%	85%	(26,783)	(25.8)
Negotiated	23,522	13,897,180	50%	50%	49%	46%	270	0.2
Sub-custodian	4,372	2,445,987	55%	54%	61%	67%	(1,198)	(4.9)
Total	***71,656***	***26,727,930***	***61%***	***58%***	***67%***	***71%***	***(27,711)***	***(10.4)***

Non-negotiated executions

More than two-thirds of BNY Mellon's non-negotiated executions were micro-sized trades, and are likely subject to an auto-repatriation process. Auto-repatriation is a process whereby investment managers use standing instructions to convert small amounts to a base currency automatically. Operational efficiency is a primary reason investment managers prefer auto-repatriation to convert foreign dividend or interest payments to the base currency. From the investment manager's perspective, oversight of income repatriation is an operational responsibility that may not present them an opportunity to add alpha. However, some investment managers overlook the importance of avoiding alpha erosion in the income repatriation process.

These micro-sized executions incurred 34 basis points of excess cost, or more than $4.1 million. Six percent of these executions were outside the day's trading range, and more than 86% of all micro executions were at disadvantageous prices. BNY Mellon should execute nearly all trades within the day's range and realize little to no excess costs. SBA should discuss these results with BNY Mellon and SBA's investment managers to understand how each party oversees the process. Prospectively, SBA may wish to benchmark auto-repatriation executions.

Table 3.2 All internal, standing executions by trade size (Contract Types C, N, T)

	Total	Market	Non-Market	Micro
Total value of all trades, $000's	10,384,763	6,742,171	2,411,993	1,230,599
Excess benefit (+)/cost (-), $000's	(26,783)	(15,575)	(7,040)	(4,168)
Benefit (+)/cost (-), bps	(25.8)	(23.1)	(29.2)	(33.9)
Total number of trades	43,762	4,655	8,929	30,178
Number with excess costs	36,709	3,401	7,186	26,122
Percentage disadvantageous by number	84%	73%	80%	87%
Value of disadvantageous, $000's	7,921,154	4,941,534	1,928,311	1,051,309
Percentage disadvantageous by value	76%	73%	80%	85%
% within days range (by value)	84%	80%	89%	94%
% within days range (by number)	92%	83%	89%	94%

Internal contract type C

Contract type C, which represents non-negotiated executions through CIBC's treasury desk, had only two executions and was last used in 2007. Individually, contract type C does not have a sufficient number of observations to draw statistically significant conclusions. While we do not analyze contract type C executions as a group, we include them in any relevant subsets, such as "internal executions" and include them within the overall dataset analysis.

Chart 3.1 All internal contract type C trades by value

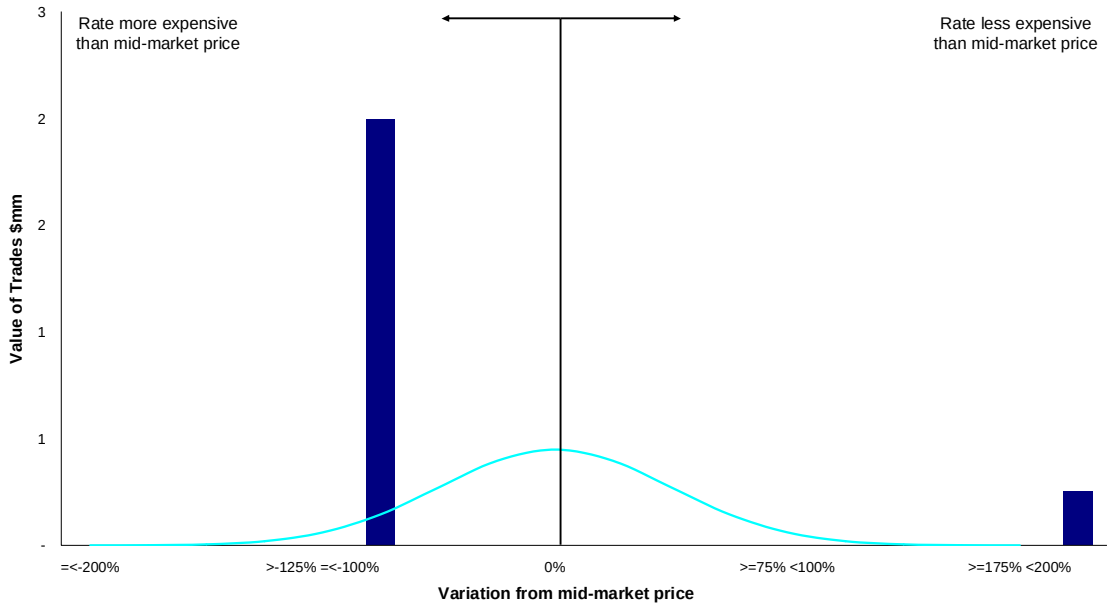
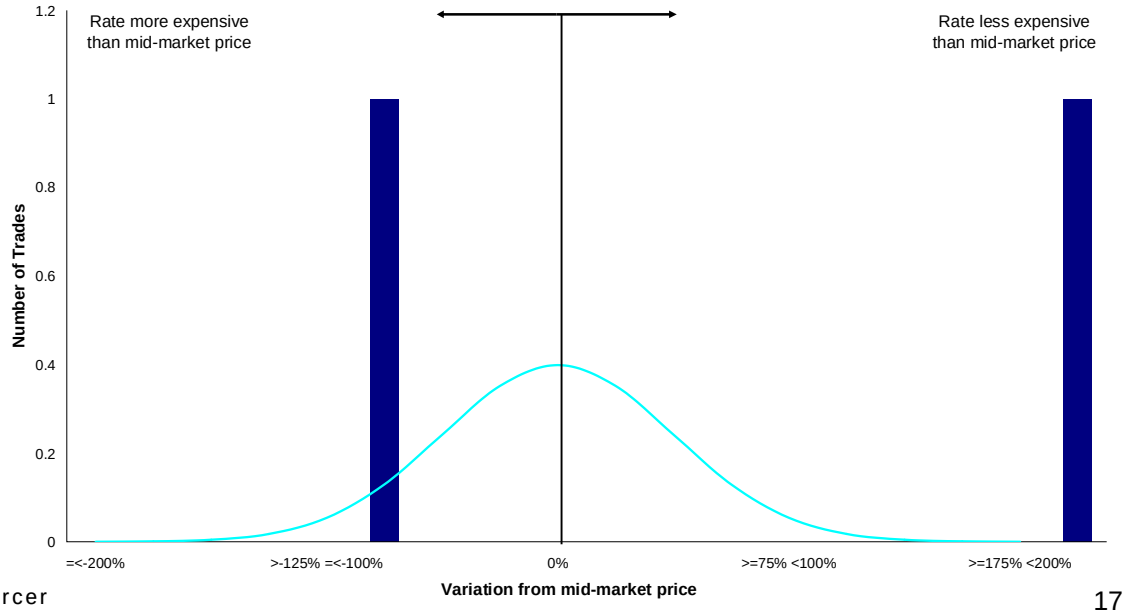


Chart 3.2 All internal contract type C trades by number



Internal contract type N

Contract type N represents 285 non-negotiated executions with BNY Mellon's London treasury desk. Overall, the London desk realized more than $164,000 in excess costs, which is approximately 159 basis points against traded value. About 98% of all internal, London executions were micro-sized trades, and are likely auto-repatriation. These micro-sized trades realized about 14 basis points of excess costs, and had about 5% of executions outside the day's trading range. The London treasury desk only executed three market-sized trades, which accumulated more than $156,000 in excess costs, or 371 basis points. Regardless of trade size, the London desk's results suggest a problematic pattern, potentially through poor internal controls. BNY Mellon should explain the reason for its London desk's poor execution pattern.

Chart 3.3 All internal contract type N trades by value

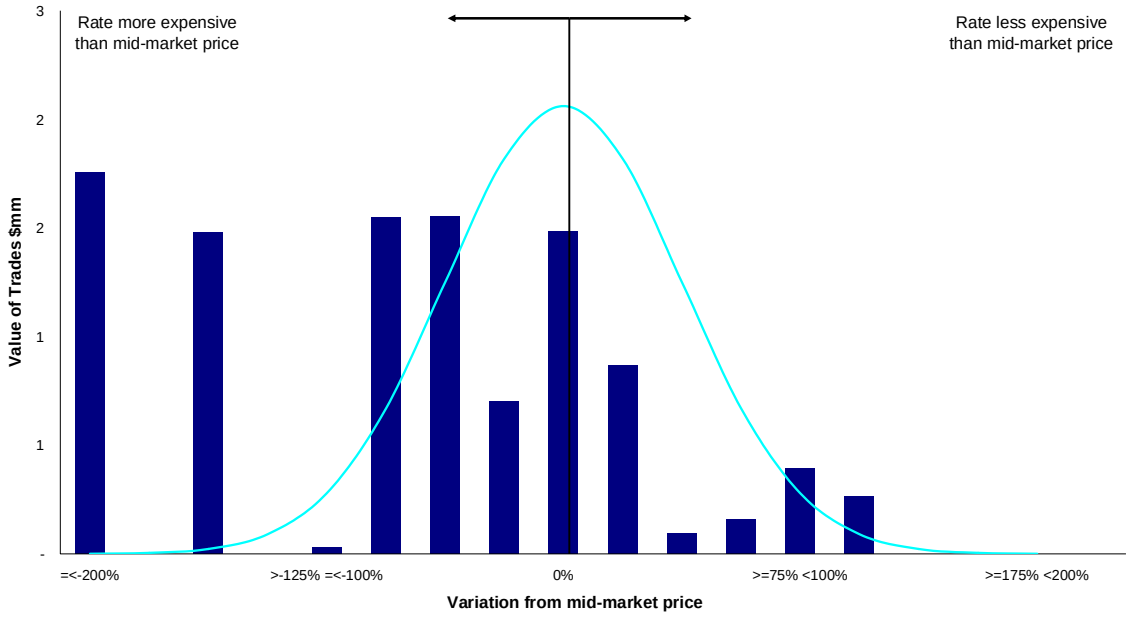
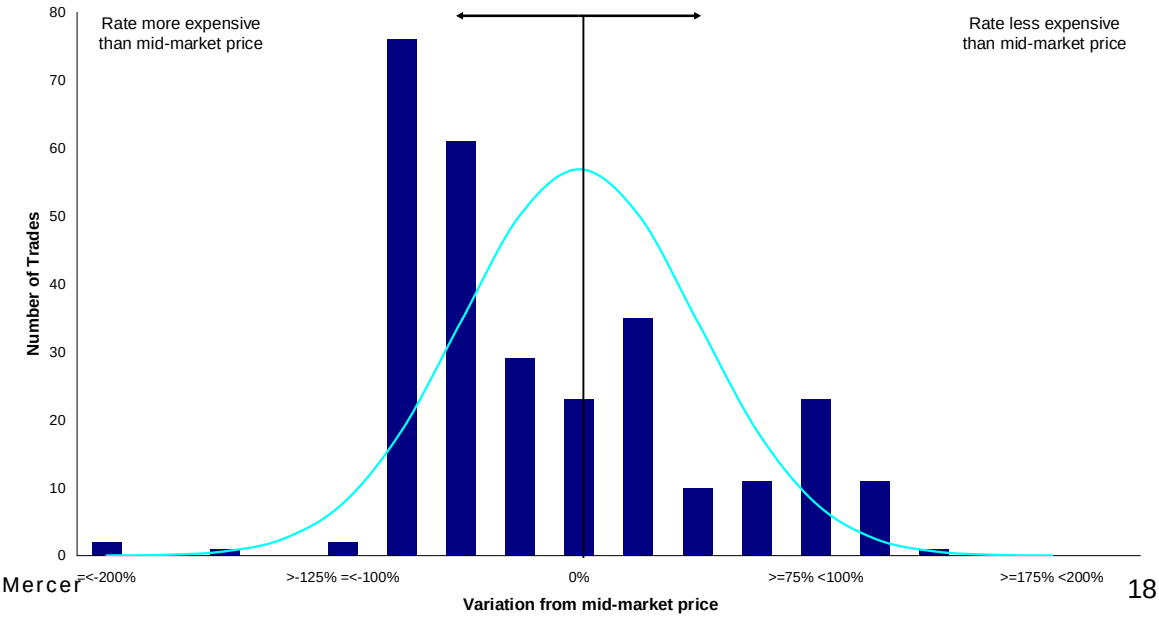


Chart 3.4 All internal contract type N trades by number



Internal contract type T

Contract type T represents all non-negotiated executions through BNY Mellon's Pittsburgh trading desk. SBA's investment managers used this method for more than 43,000 trades and $10.3 billion of value. While this contract is the most frequently used by number, 45.1% of all trades, it represents just 20.6% of value transacted. Overall, the Pittsburgh desk realized excess costs of more than 25 basis points, or $26.6 million. More than 8% of all contract type T executions were outside the day's trading range. The Pittsburgh desk executed more market and non-market trades than any other internal contract type, and cost a total of about 24 basis points, or $22.5 million. The Pittsburgh treasury desk's executions are problematic and suggest poor transaction controls.

Chart 3.5 All internal contract type T trades by value

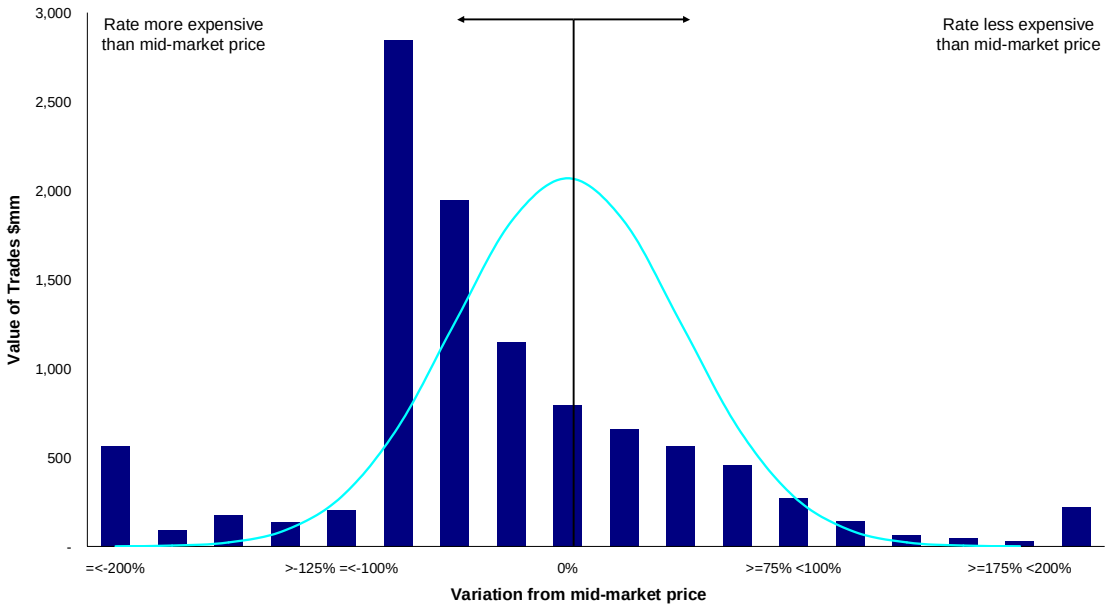
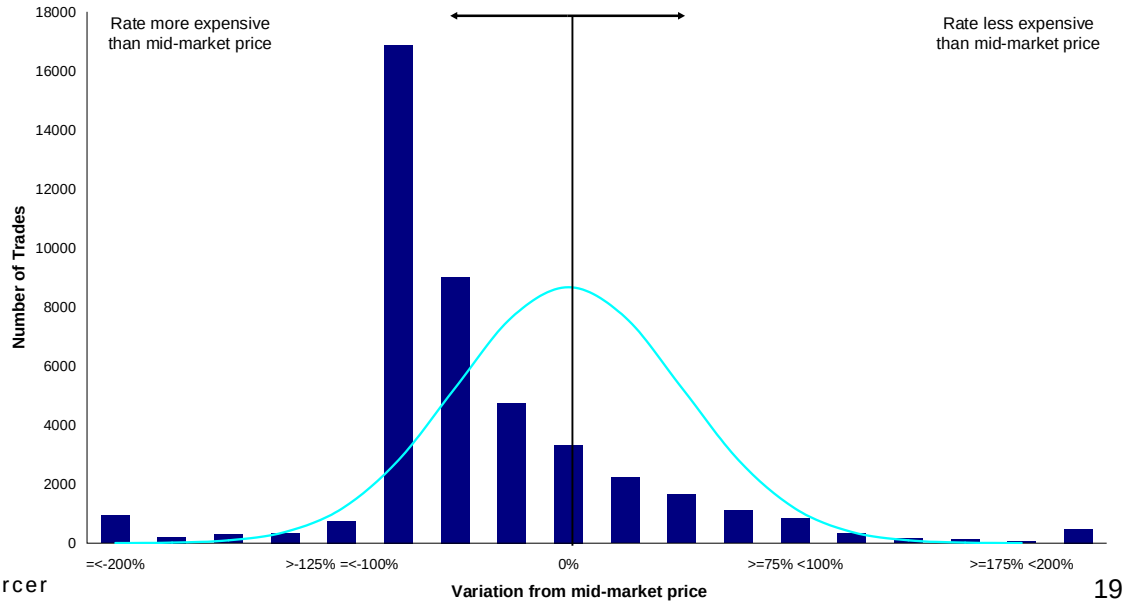


Chart 3.6 All internal contract type T trades by number



Negotiated executions

SBA's investment managers may negotiate execution orders directly with the London and Pittsburgh desks instead of routing through BNY Mellon's custody system for non-negotiated execution. We would expect these negotiated contract rates to realize better execution than non-negotiated orders. Overall, negotiated custodian executions realized about $270,000 in excess benefit, or 0.2 basis points. Negotiated custodian executions performed as expected, with less than 2% of all trades executed outside the day's trading range and about half of these being at a disadvantageous rates.

Table 3.3 All internal, negotiated executions by trade size (Contract Types L, X)

	Total	Market	Non-Market	Micro
Total value of all trades, $000's	13,897,180	11,689,325	1,491,466	716,389
Excess benefit (+)/cost (-), $000's	270	36	20	214
Benefit (+)/cost (-), bps	0.2	0.0	0.1	3.0
Total number of trades	23,522	6,359	5,287	11,876
Number with excess costs	11,245	3,145	2,557	5,543
Percentage disadvantageous by number	48%	49%	48%	47%
Value of disadvantageous, $000's	6,899,666	5,847,532	724,367	327,766
Percentage disadvantageous by value	50%	50%	49%	46%
% within days range (by value)	99%	99%	99%	99%
% within days range (by number)	99%	99%	99%	98%

Internal contract type L

Contract type L represents FX executions negotiated directly with BNY Mellon's London treasury desk. The London desk executed more than 3,500 executions through this contract type for SBA, representing about $3.4 billion. Overall, the direct orders with the London desk realized more than $486,000 in excess benefit, or about 1.4 basis points. The desk executed all trade-sizes as expected, with only micro-sized trades realizing a loss: 0.5 basis points of excess cost.

Chart 3.7 All internal contract type L trades by value

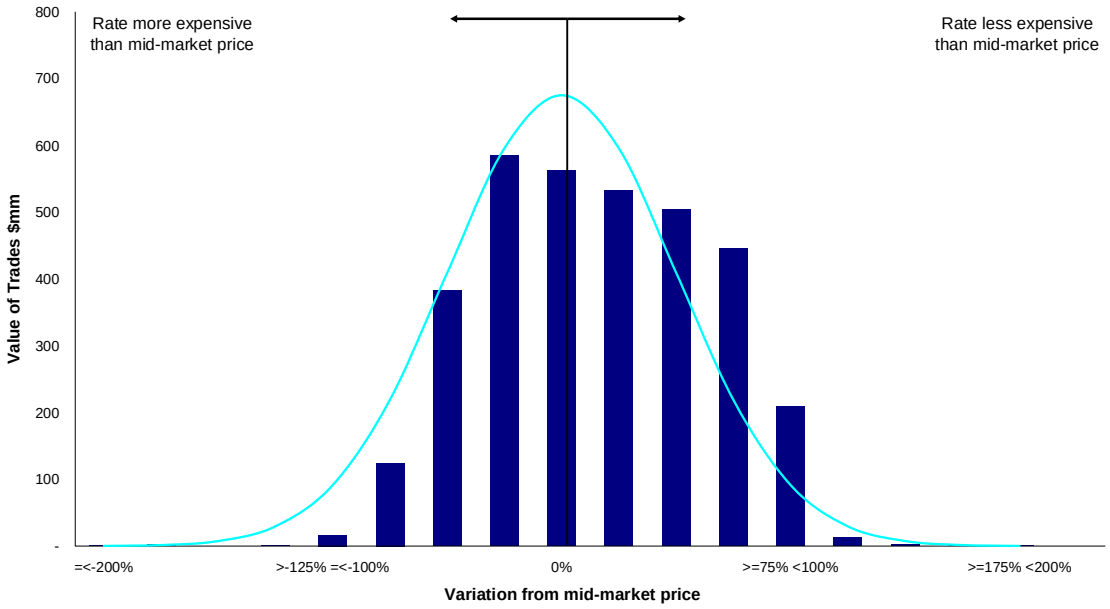
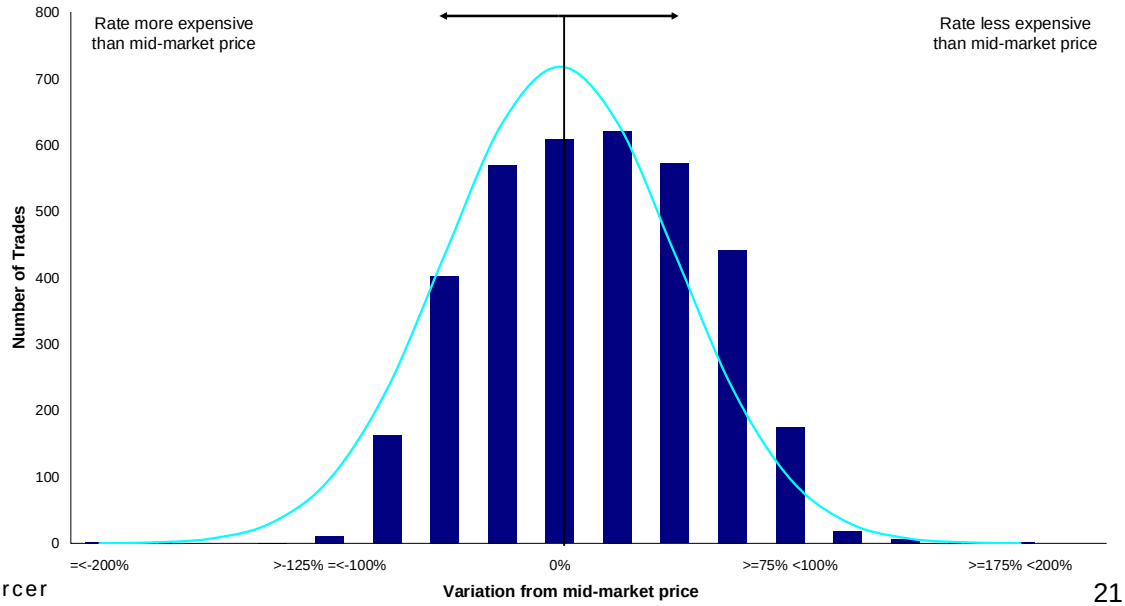


Chart 3.8 All internal contract type L trades by number



Internal contract type X

Contract type X represents FX orders negotiated directly with BNY Mellon's Pittsburgh desk. The desk handled about 20,000 negotiated executions for SBA, representing about $10.5 billion traded. In total, contract type X executions realized about $216,000 in excess costs, or about 0.2 basis points. Overall, the Pittsburgh desk executed the orders well, with about 1% being executed outside the day's trading range. Micro-sized trades gained about 3 basis points, or about $217,000.

Chart 3.9 All internal contract type X trades by value

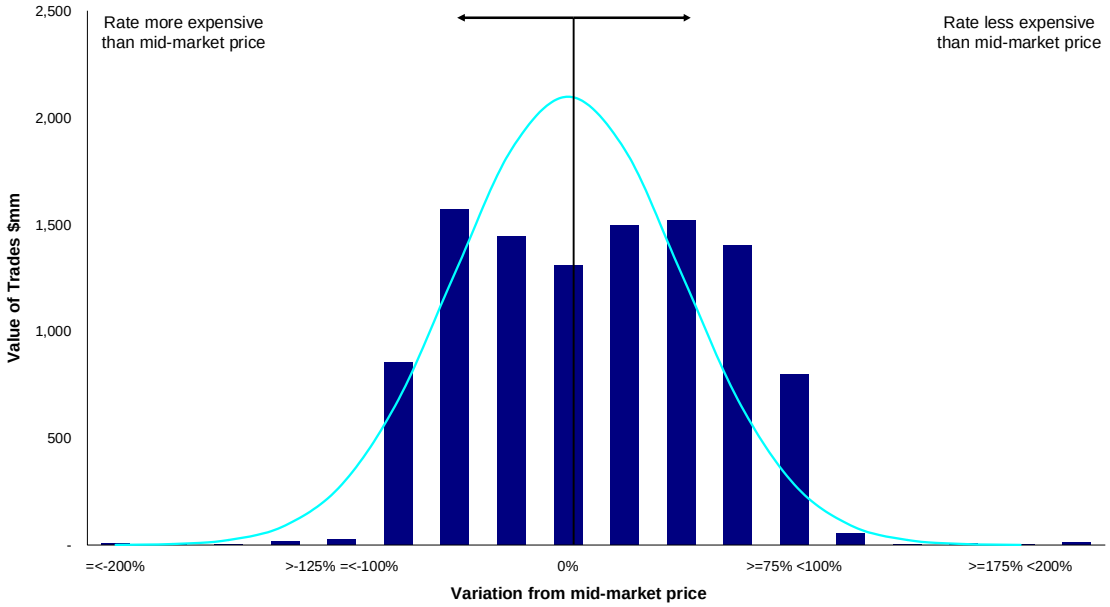
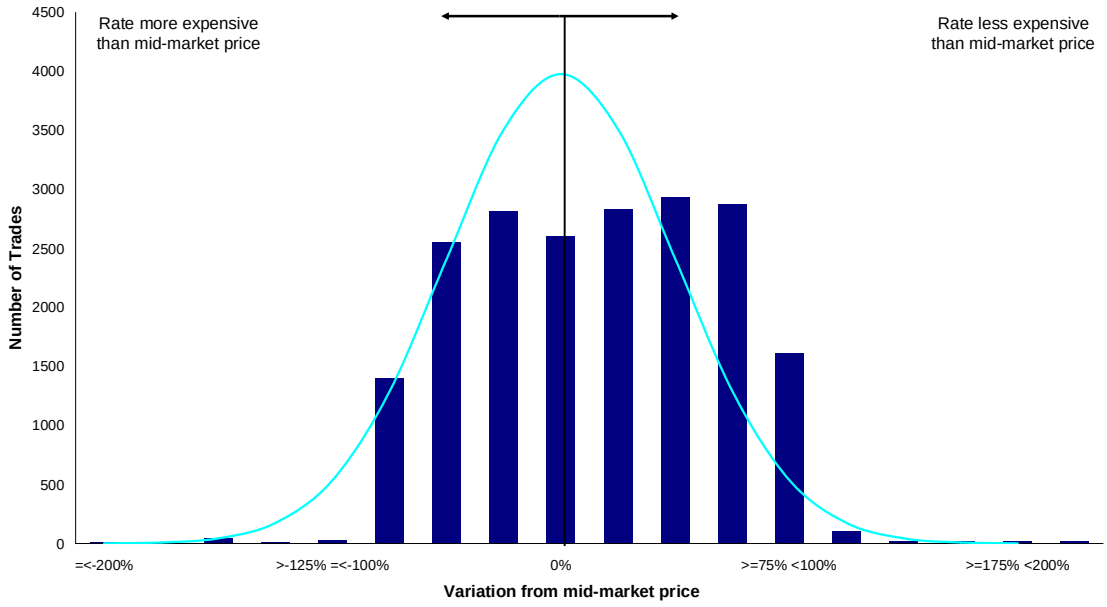


Chart 3.10 All internal contract type X trades by number



Sub-custodian executions

Internal contract type I

Contract type I trades represent executions by BNY Mellon's sub-custodians. These are non-negotiated rates where market convention or government rules require local market pricing. About 99% of all contract type I executions involve secondary currencies and about 32% contain SBA's restricted currencies.[5] Overall, the sub-custodians realized excess costs of about 4.9 basis points, or $1.2 million. We expect secondary currencies to deviate more than reserve currencies, and thus these executions are not surprising, but still somewhat more expensive than we would expect. Only 48% of sub-custodian executions were within the day's trading range. Regardless of currency type, nearly all executions should be within the day's trading range; SBA should discuss these results with BNY Mellon.

Table 3.4 All non-negotiated, sub-custodian executions by trade size (Contract Type I)

	Total	Market	Non-Market	Micro
Total value of all trades, $000's	2,445,987	2,028,695	315,889	101,403
Excess benefit (+)/cost (-), $000's	(1,198)	(794)	(215)	(189)
Benefit (+)/cost (-), bps	(4.9)	(3.9)	(6.8)	(18.7)
Total number of trades	4,372	1,303	1,110	1,959
Number with excess costs	2,759	757	678	1,324
Percentage disadvantageous by number	63%	58%	61%	68%
Value of disadvantageous, $000's	1,354,471	1,093,982	192,454	68,035
Percentage disadvantageous by value	55%	54%	61%	67%
% within days range (by value)	53%	54%	49%	45%
% within days range (by number)	48%	52%	49%	44%

[5] SBA considers the following currencies "restricted": Brazilian real, Egyptian pound, Indonesian rupiah, Indian rupee, South Korean won, Moroccan dirham, Malaysian ringgit, Philippine peso, Thai baht, and Taiwan dollar.

Chart 3.11 All internal contract type I trades by value

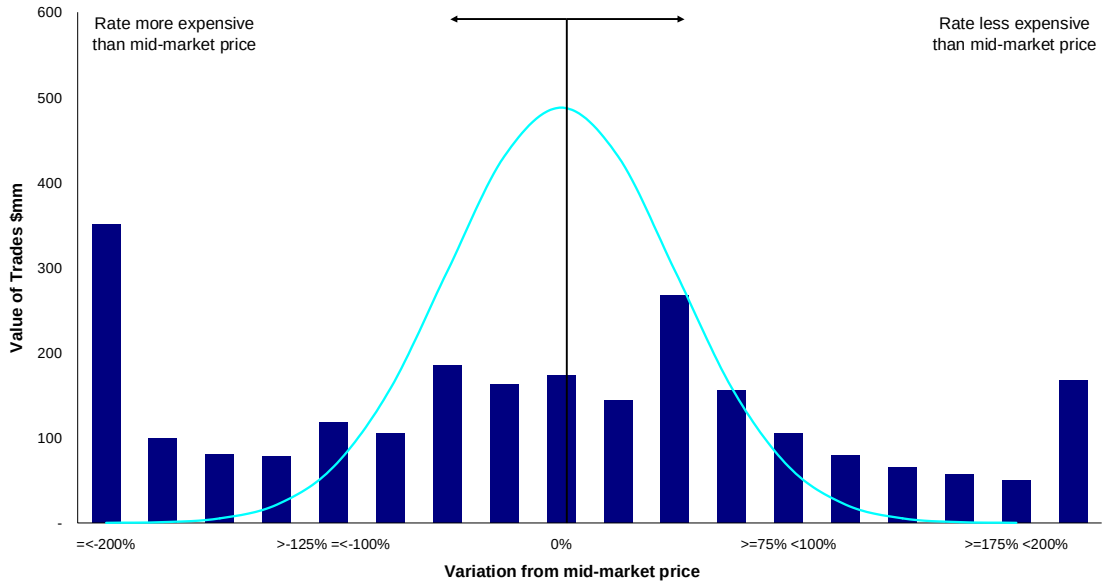
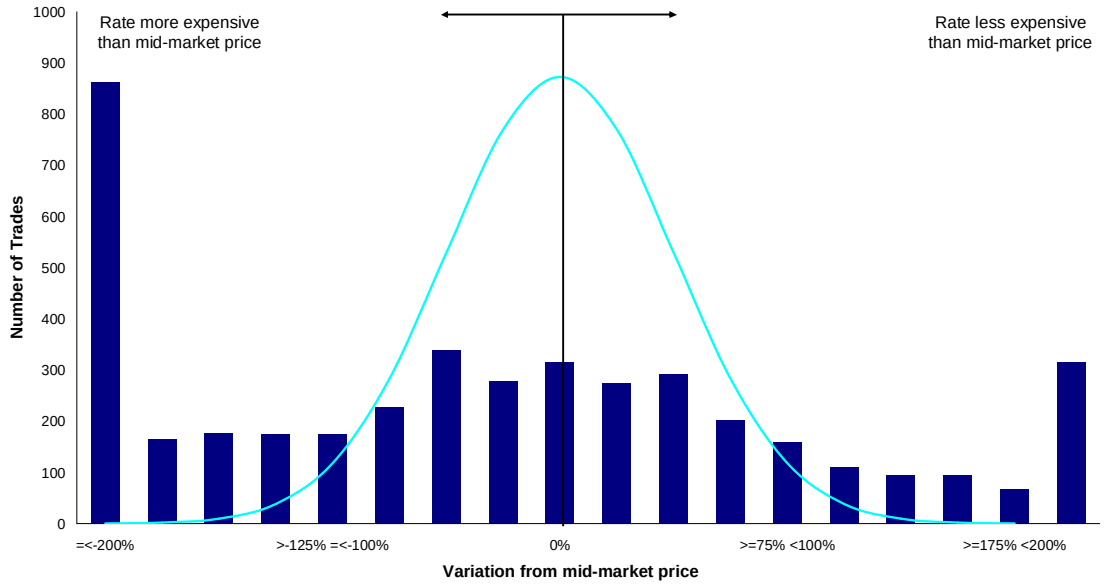


Chart 3.12 All internal contract type I trades by number



External trade execution

External broker executions

Contract type E

SBA's investment managers may execute FX trades with any external broker; for this reason, we consider all external broker executions as negotiated rates whether the investment manager actively or passively negotiates with the broker. BNY Mellon records all external trade executions as contract type E.

Overall, external brokers realized an excess benefit of 2.6 basis points, or $6.1 million. External brokers executed less than 2% of all trades outside the day's trading range, and more than half of all executions were advantageous. The external brokers realized excess benefits across all trade-sizes. Only cross trades realized excess costs, which accumulated to about $278,000, or less than 1 basis point.

Table 3.5 External executions by trade size (contract type E)

	Total	Market	Non-Market	Micro
Total value of all trades, $000's	23,650,021	21,098,813	2,031,615	519,593
Excess benefit (+)/cost (-), $000's	6,133	5,666	397	69
Benefit (+)/cost (-), bps	2.6	2.7	2.0	1.3
Total number of trades	24,652	9,301	6,952	8,399
Number with excess costs	11,421	4,360	3,221	3,840
Percentage disadvantageous by number	46%	47%	46%	46%
Value of disadvantageous, $000's	11,017,689	9,838,505	938,555	240,629
Percentage disadvantageous by value	47%	47%	46%	46%
% within days range (by value)	99%	99%	98%	98%
% within days range (by number)	98%	99%	98%	98%

Chart 3.13 All external contract type E trades by value

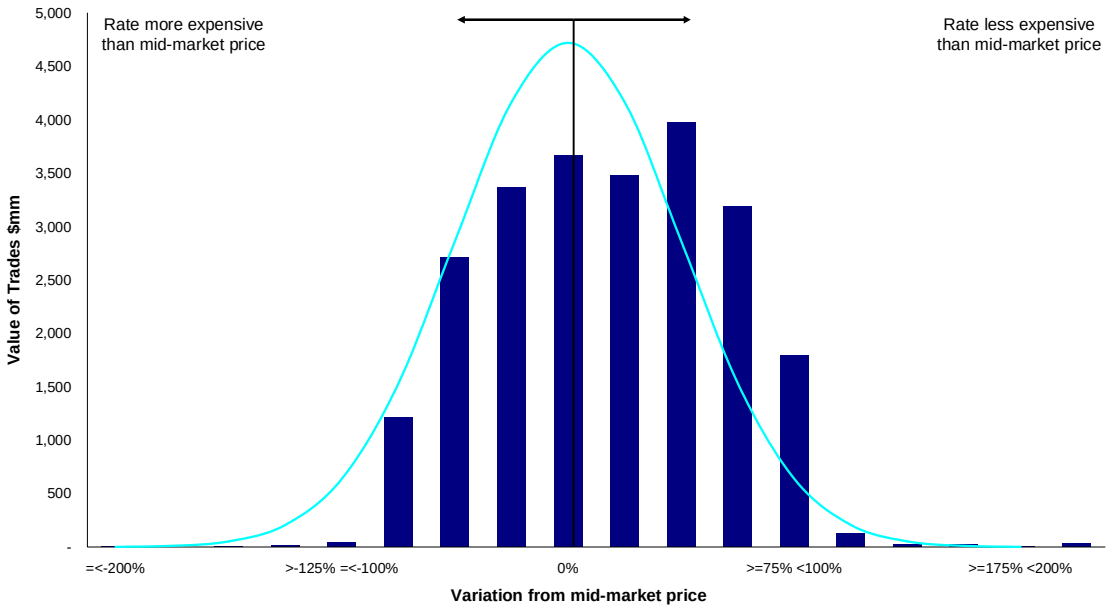
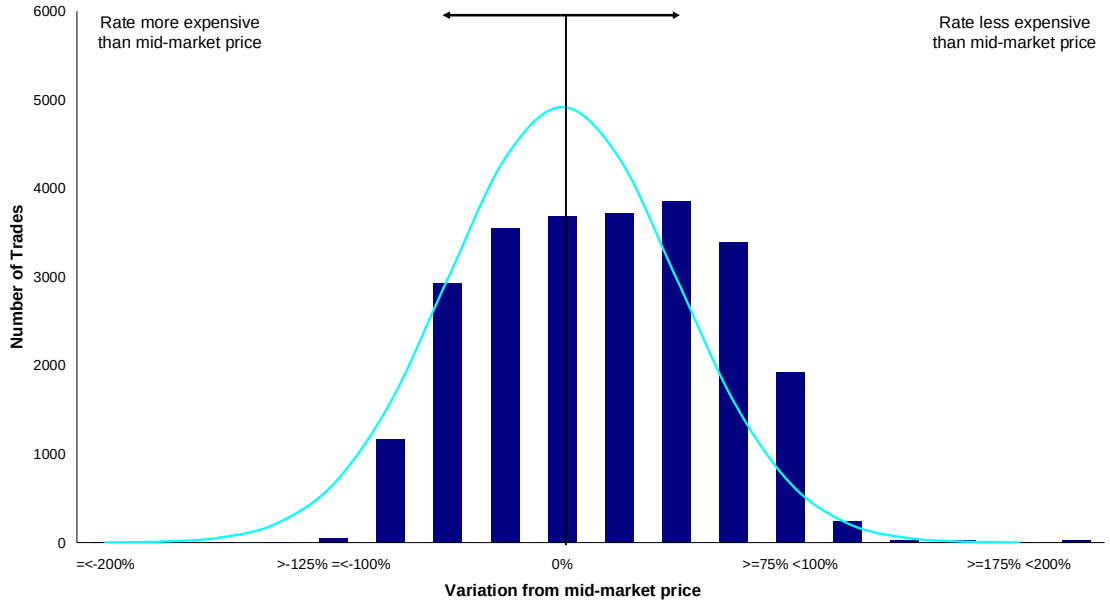


Chart 3.14 All external contract type E trades by number



4

Trading period analysis

For the period under review, the SBA's foreign equity asset class grew from approximately $16 billion to almost $21 billion. During this period, the SBA added to its international equity exposure and consequently hired nine investment managers in October 2007 to boost exposure to international small-cap stocks. The addition of these nine managers increased the volume of FX transactions needed for trade settlement and the repatriation of dividends and other income items. In addition, the SBA's exposure to emerging markets increased as emerging markets grew to represent a larger proportion of the equity asset class allocation. FX executions in several emerging markets are subject to government or market restrictions that tend to result in higher FX execution costs.

The frequency of FX execution has increased each full-year since 2006, but execution type has varied as shown in Table 4.1. External brokers were the best performing contract type in each full year, but use of external brokers has decreased from 42% in 2006 to 19% in 2009. Internal, non-negotiated executions were SBA's worst performing contract type in each measurement period except 2010, which has partial year results. SBA's investment managers have increased their use of internal, non-negotiated executions each full year, from 33% in 2006 to 54% in 2009. The investment managers' use of internal, negotiated rates has remained around 25% each full year.

The first five-months of 2010 show a trend reversal that may reflect SBA's recent efforts to alter investment manager behavior: investment managers have increased their use of external executions to 32%, while decreasing internal, non-negotiated executions from 54% to 42%.

Table 4.1 Summary table, all spot executions by trade year

Year[6]	Trade type	Volume by # of trades	Percentage by year	Excess (cost) / benefit USD (000s)	Bps of traded value
2005	Internal, non-negotiated	1,247	25.8%	(996,644)	(21.2)
	Internal, negotiated	1,171	24.2%	(161,832)	(1.9)
	Internal, Sub-custodian	380	7.9%	(261,780)	(13.9)
	External, negotiated	2,033	42.1%	237,077	1.5
2006	Internal, non-negotiated	3,642	32.5%	(1,275,650)	(17.9)
	Internal, negotiated	2,455	21.9%	(162,545)	(0.8)
	Internal, Sub-custodian	1,315	11.7%	(505,992)	(6.6)
	External, negotiated	3,809	33.9%	109,653	0.3
2007	Internal, non-negotiated	5,169	38.3%	(1,635,409)	(14.2)
	Internal, negotiated	3,028	22.5%	259,822	0.9
	Internal, Sub-custodian	1,251	9.3%	(11,432)	(0.1)
	External, negotiated	4,032	29.9%	752,853	1.8
2008	Internal, non-negotiated	13,186	49.5%	(8,487,399)	(26.6)
	Internal, negotiated	6,974	26.2%	198,305	0.6
	Internal, Sub-custodian	750	2.8%	(154,804)	(2.6)
	External, negotiated	5,704	21.4%	519,499	0.7
2009	Internal, non-negotiated	16,354	54.2%	(12,399,078)	(31.9)
	Internal, negotiated	7,419	24.6%	23,145	0.1
	Internal, Sub-custodian	520	1.7%	(219,963)	(30.4)
	External, negotiated	5,857	19.4%	2,583,114	5.6
2010	Internal, non-negotiated	4,164	41.6%	(1,988,510)	(20.5)
	Internal, negotiated	2,475	24.7%	113,149	1.1
	Internal, Sub-custodian	156	1.6%	(44,212)	(40.7)
	External, negotiated	3,217	32.1%	1,930,575	9.7
Total		***96,308***		***(21,578,057)***	***(4.3)***

[6] Years 2005 and 2010 are partial years; specifically, 2005 covers from 1 July 2005 and 2010 covers until 31 May 2010.

Table 4.2 All spot executions by trade size

Year[7]	Trades		% disadvantageous by value				Excess (cost) / benefit	
	Volume in # of trades	Volume in USD (000's)	Total	Market	Non-market	Micro	USD (000's)	Bps of traded value
2005	4,831	3,079,284	55%	56%	53%	59%	(1,183)	(3.8)
2006	11,221	7,385,498	54%	53%	55%	62%	(1,835)	(2.5)
2007	13,480	9,063,731	50%	48%	57%	67%	(634)	(0.7)
2008	26,614	14,705,695	55%	53%	63%	65%	(7,924)	(5.4)
2009	30,150	12,110,546	57%	54%	65%	68%	(10,013)	(8.3)
2010	10,012	4,033,197	52%	50%	58%	62%	11	0.0
Total	***96,308***	***50,377,952***	***54%***	***52%***	***61%***	***66%***	***(21,578)***	***(4.3)***

[7] Years 2005 and 2010 are partial years; specifically, 2005 covers from 1 July 2005 and 2010 covers until 31 May 2010.

Trading year 2005[8]

In 2005, SBA realized about $1.2 million in excess trading costs, or about 3.8 basis points. External executions comprised about 42% of all executions by number and realized 1.5 basis points in excess benefits. Internal, non-negotiated executions were 26% of all executions and realized 21.2 basis points of excess costs. Internal negotiated and sub-custodian executions realized 1.9 basis points excess costs and 13.9 basis points of excess costs, respectively.

Chart 4.1 All 2005 spot trades by value

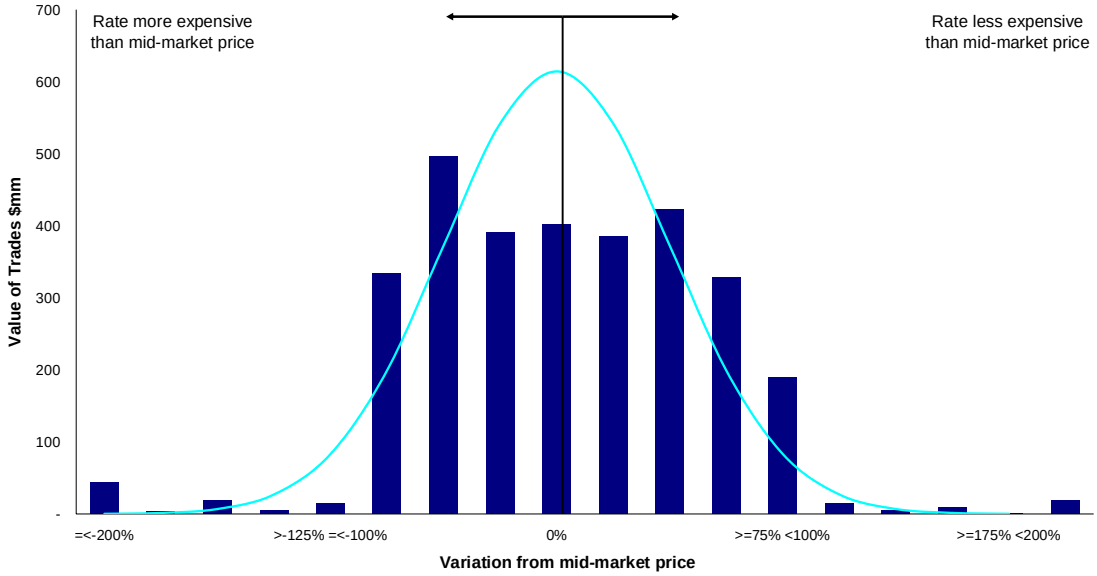
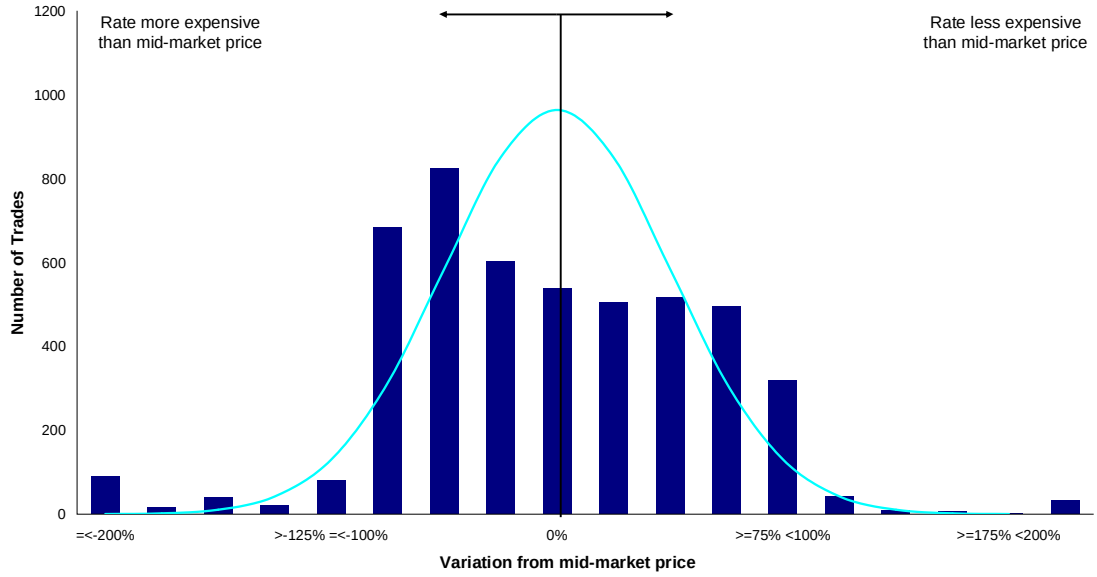


Chart 4.2 All 2005 spot trades by number



[8] Years 2005 is a partial year; specifically, 2005 covers from 1 July 2005.

Trading year 2006

In 2006, SBA realized about $1.8 million in excess trading costs, or about 2.5 basis points. External executions comprised about 34% of all executions by number and realized 0.3 basis points in excess benefits. Internal, non-negotiated executions were 33% of all executions and realized 17.9 basis points of excess costs. Internal negotiated and sub-custodian executions realized 0.8 basis points of excess costs and 6.6 basis points of excess costs, respectively.

Chart 4.3 All 2006 spot trades by value

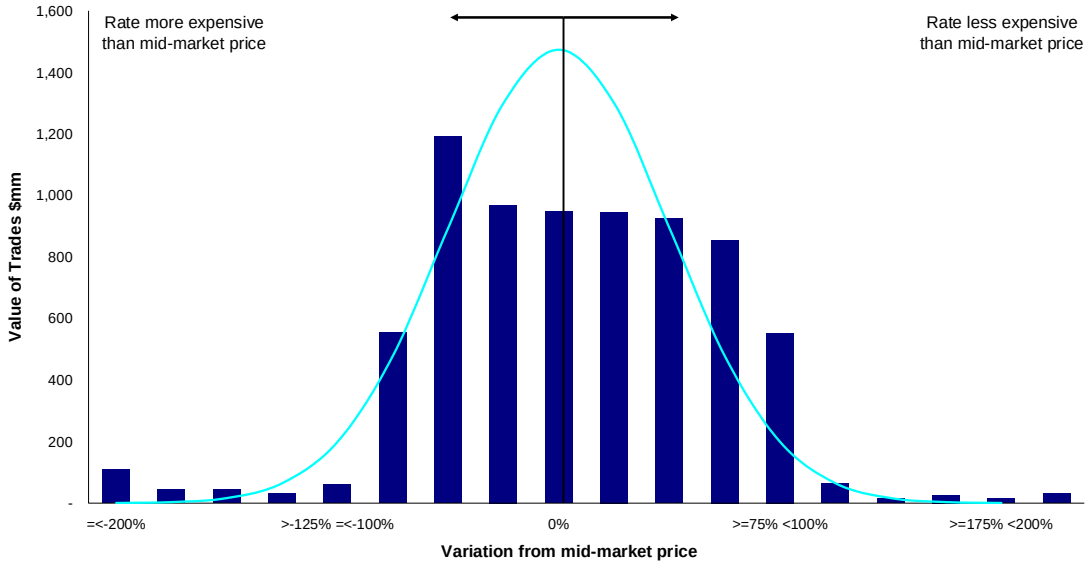
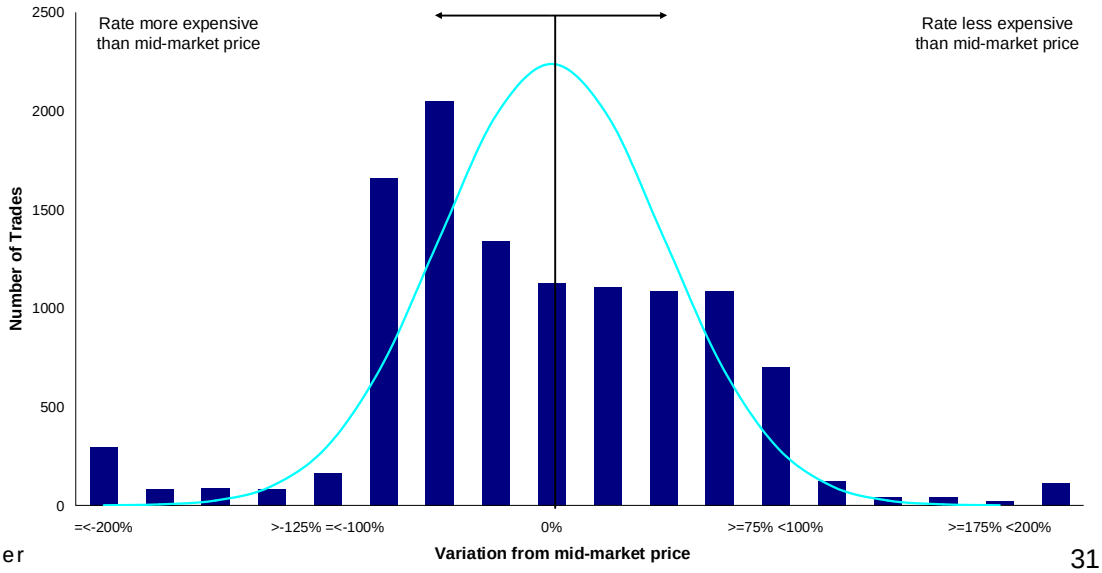


Chart 4.4 All 2006 spot trades by number



Trading year 2007

In 2007, SBA realized about $634,000 in excess trading costs, or about 0.7 basis points. Internal, non-negotiated execution became the most frequently used execution contract type at 38% of all executions. These executions realized about 14.2 basis points of excess costs. External executions comprised about 30% of all executions by number and realized 1.8 basis points in excess benefits. Internal negotiated executions realized about 0.9 basis points of excess benefit, while sub-custodian executions realized 0.1 basis points excess costs.

Chart 4.5 All 2007 spot trades by value

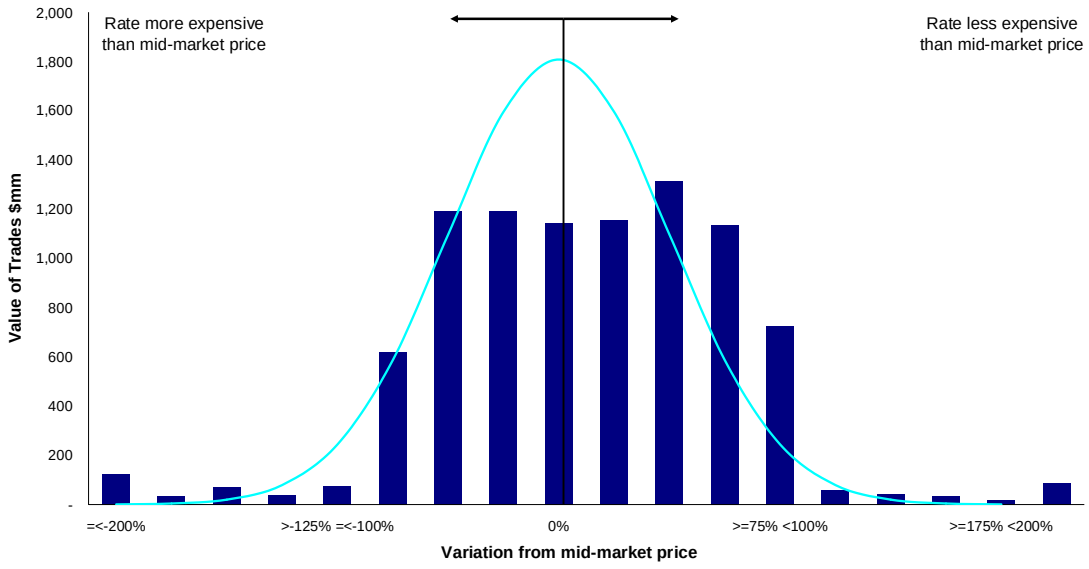
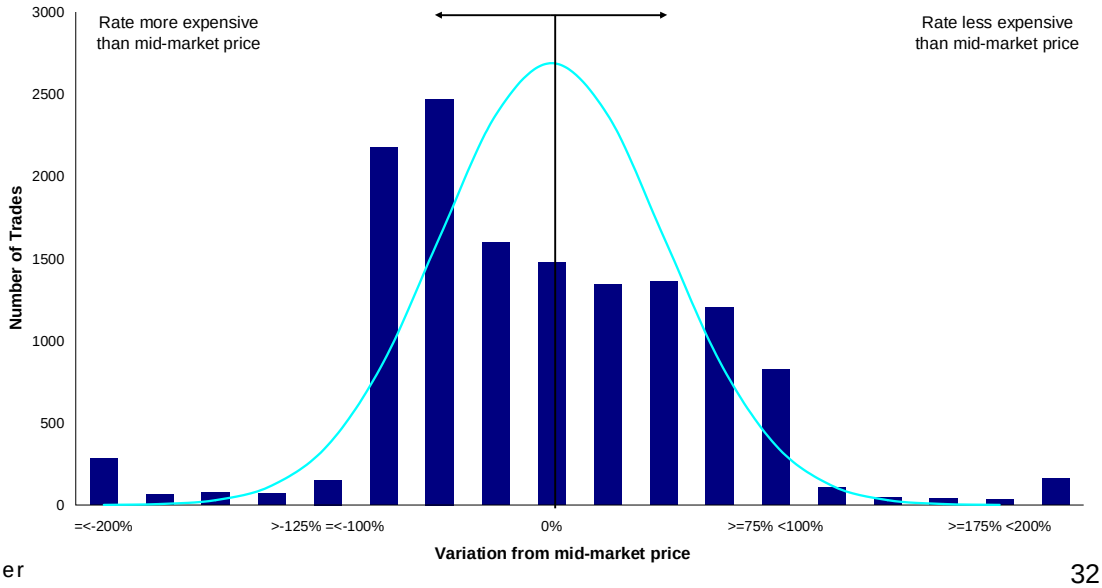


Chart 4.6 All 2007 spot trades by number



Trading year 2008

In 2008, SBA realized about $7.9 million in excess trading costs, or about 5.4 basis points. Internal, non-negotiated executions comprised about 50% of all executions by number and realized 26.6 basis points in excess costs. Internal, negotiated executions comprised about 26% of all executions and realized about 0.6 basis points in excess benefit. External executions dropped to 21% of all executions and realized 0.7 basis points of excess benefit. Sub-custodian executions realized 2.6 basis points of excess costs during the year.

Chart 4.7 All 2008 spot trades by value

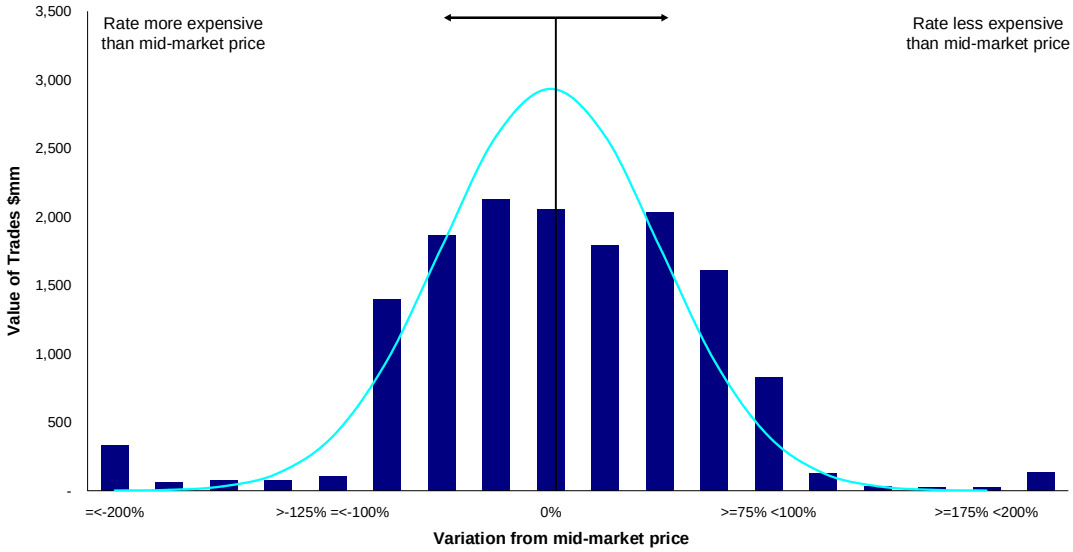
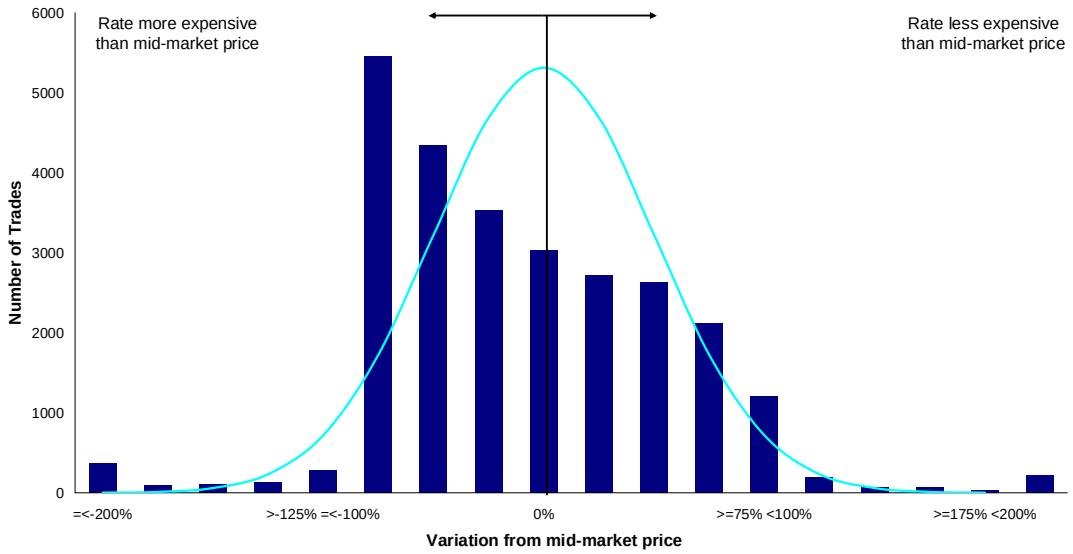


Chart 4.8 All 2008 spot trades by number



Trading year 2009

In 2009, SBA realized about $10.0 million in excess trading costs, or about 8.3 basis points. Internal, non-negotiated executions increased to 54% of all executions by number and realized 31.9 basis points in excess costs. Internal, negotiated executions comprised about 25% of all executions and realized about 0.1 basis points in excess benefit. External executions dropped to 19% of all executions and realized 5.6 basis points of excess benefit. Sub-custodian executions realized 30.4 basis points of excess costs, but were only 2% of all 2009 executions.

Chart 4.9 All 2009 spot trades by value

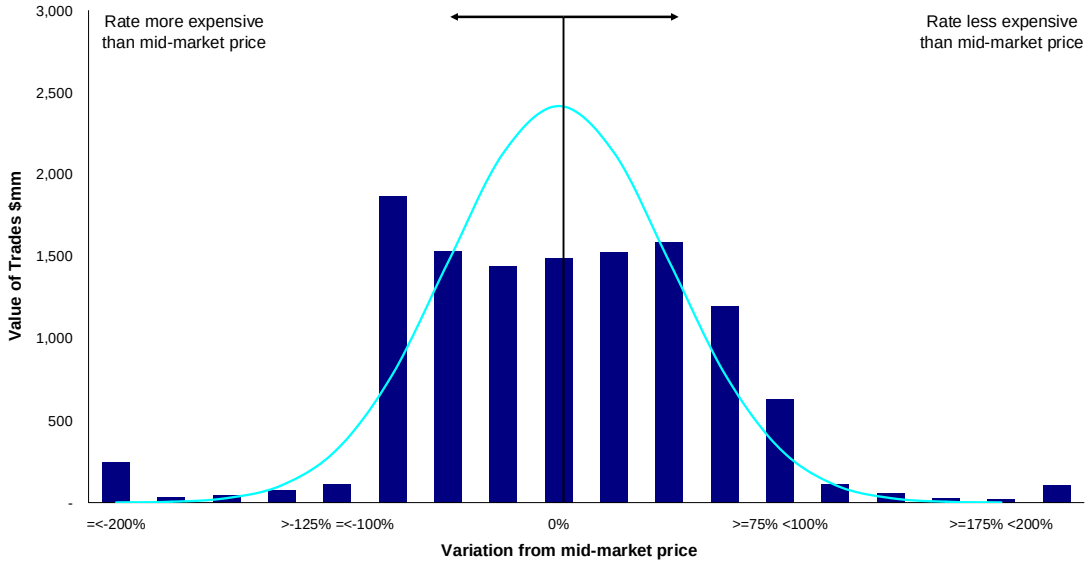
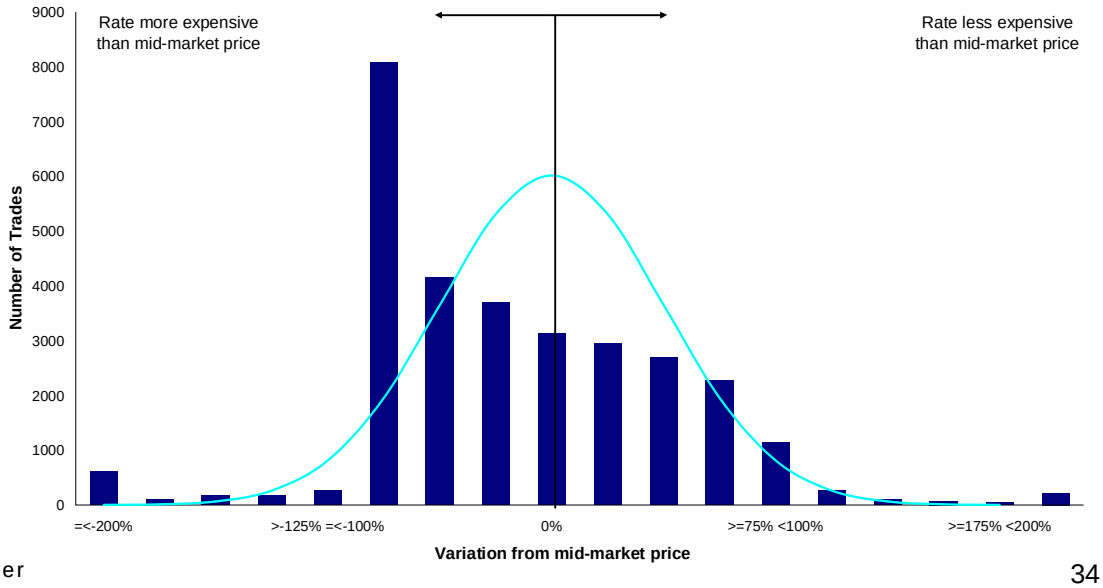


Chart 4.10 All 2009 spot trades by number



Trading year 2010[9]

During the first five-months of 2010, SBA realized about $11,000 in excess trading benefits, or less than one-tenth of a basis point. Internal, non-negotiated executions decreased to 42%, but remained the most frequently used contract type and realized 20.5 basis points of excess costs. External execution increased to 32% of all trades and realized 9.7 basis points of excess benefit. Internal negotiated executions were 25% of all executions and realized 1.1 basis points of excess benefit. Sub-custodian executions realized 40.7 basis points of excess costs, but were less than 2% of all 2010 executions.

Chart 4.11 All 2010 spot trades by value

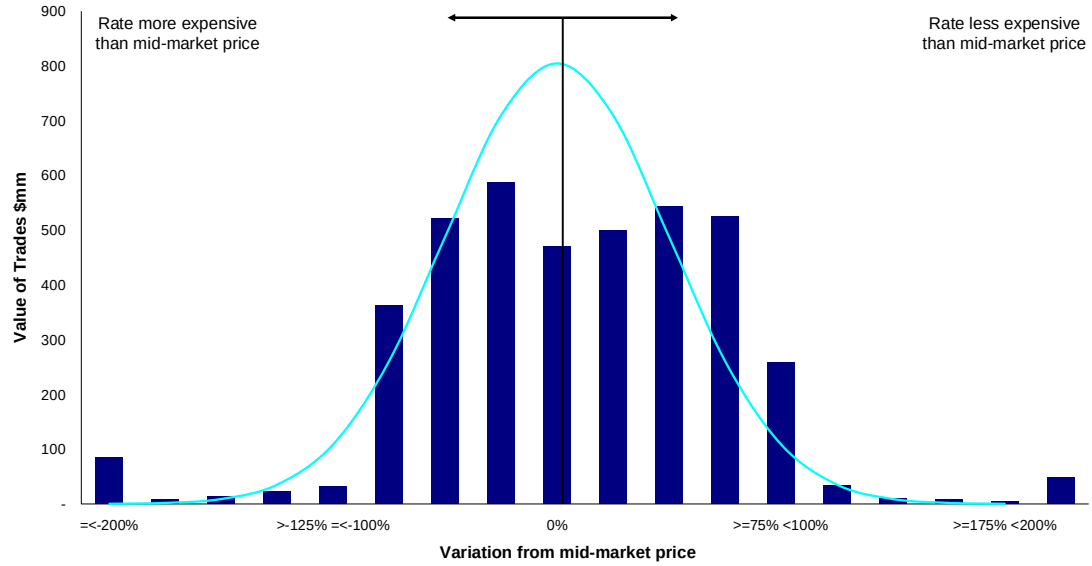
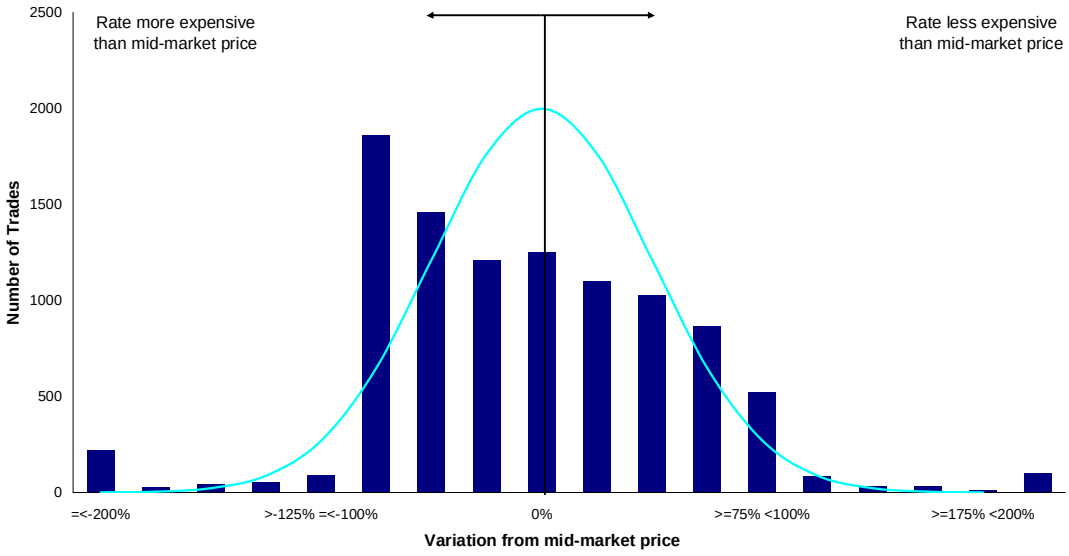


Chart 4.12 All 2010 spot trades by number



[9] Year 2010 is a partial year; specifically, 2010 covers until 31 May 2010.

5

Trade size analysis

SBA's investment managers executed approximately $50.4 billion in spot executions during the review period at an excess cost of 4.3 basis points. Market-sized executions, which represent $41.6 billion, but only 22% of spot trades by number, incurred an excess cost of $10.7 million, or 2.6 basis points. Eight-percent of market trades were outside the day's trading range, which is a larger percentage than expected from organizations with effective trading controls.

Micro-trades, which accounted for $4.1 million in total costs and 54% of spot trades by number, were problematic. While 6% of micro-trades were outside the day's trading range, micro-trades accumulated more than 16 basis points of excess cost. Mercer Sentinel expects BNY Mellon to execute nearly 100% of trades within the day's posted market prices, regardless of trade size.

Table 5.1 All spot executions by trade size

	Total	Market	Non-Market	Micro
Total value of all trades, $000's	50,377,952	41,559,006	6,250,962	2,567,984
Excess benefit (+)/cost (-), $000's	(21,578)	(10,667)	(6,837)	(4,074)
Benefit (+)/cost (-), bps	(4.3)	(2.6)	(10.9)	(15.9)
Total number of trades	96,308	21,618	22,278	52,412
Number with excess costs	62,134	11,663	13,642	36,829
Percentage disadvantageous by number	65%	54%	61%	70%
Value of disadvantageous, $000's	27,192,980	21,721,554	3,783,687	1,687,739
Percentage disadvantageous by value	54%	52%	61%	66%
% within days range (by value)	94%	94%	92%	94%
% within days range (by number)	93%	92%	92%	94%

Market trades

Market-sized executions contributed about $10.7 million in excess trading costs, which is about 2.6 basis points of total volume traded. Market-sized trades are the most efficient trade size in FX markets and should realize minimal excess costs with nearly all trades executing within the day's trading range. Overall, 8% of market-sized trades executed above the day's highest price or below the day's lowest price. Internal contract executions contributed about 92% of the 1,600+ executions outside the day's trading range and accumulated more about $16.3 million in excess costs, or 8.0 basis points. SBA should question BNY Mellon on its market-sized execution controls, as BNY Mellon should execute almost all trades within the day's trading range. External executions contributed $5.6 million in excess benefit, or about 2.7 basis points.

Chart 5.1 All spot market sized trades by value

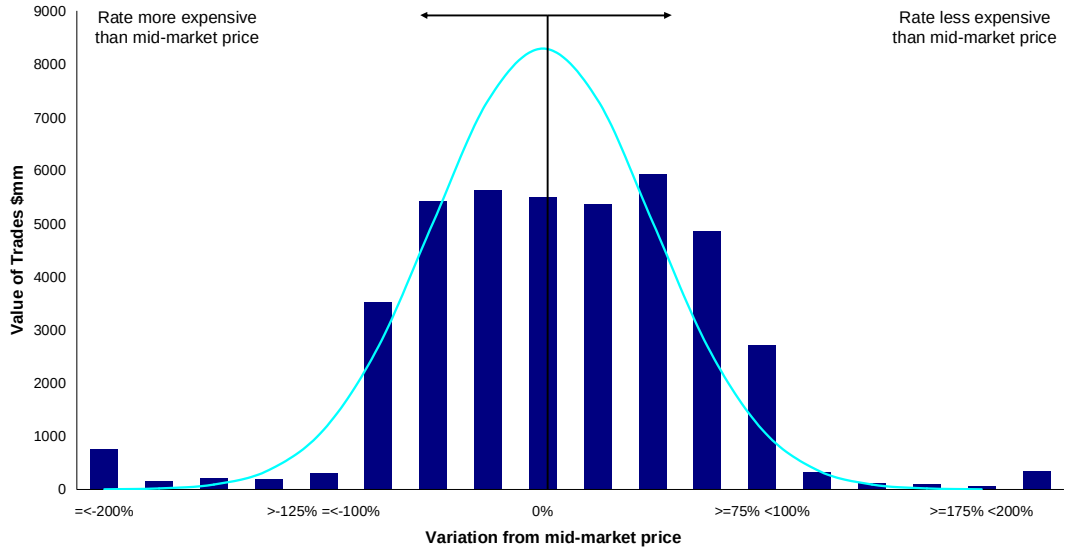
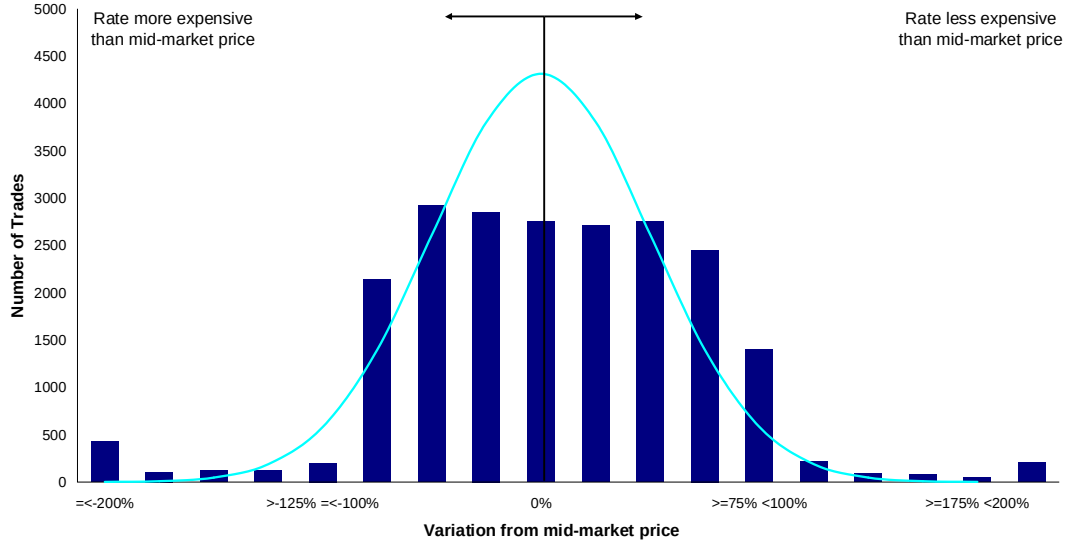


Chart 5.2 All spot market sized trades by number



Non-market trades

Non-market trades are less efficient to trade than market-sized orders, and subsequently may incur greater excess costs. SBA realized $6.8 million in excess costs from non-market sized executions, or about 10.9 basis points. About 8% of executions were outside the day's trading range, which is excessive. Internal execution types accounted for about 92% of the 1,700+ executions outside the day's trading range, and accumulated more than $7.2 million in excess trading costs. Non-market sized executions in external contract types benefited by about $397,000, or about 2 basis points.

Chart 5.3 All spot non-market trades by value

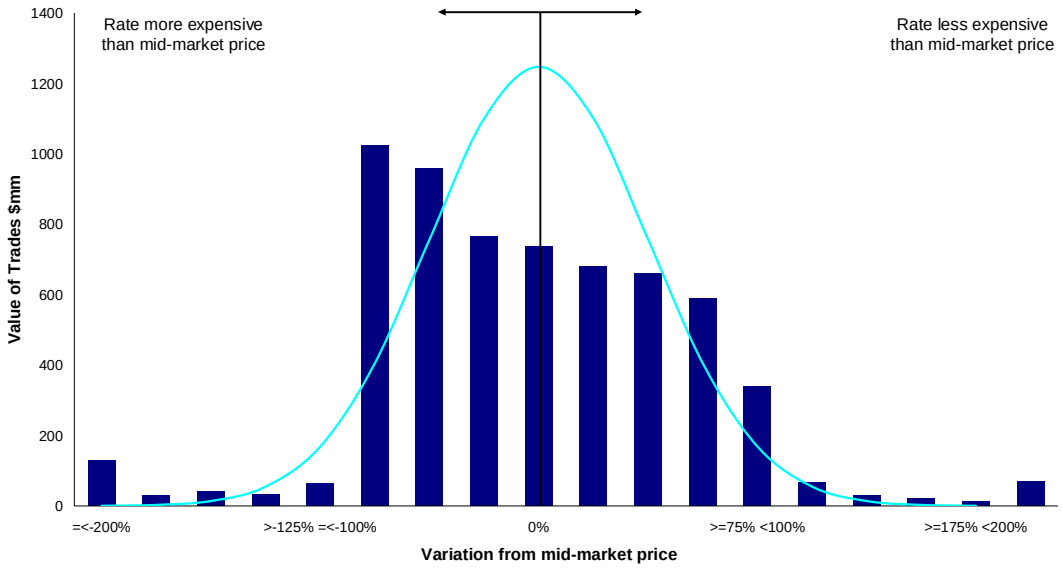
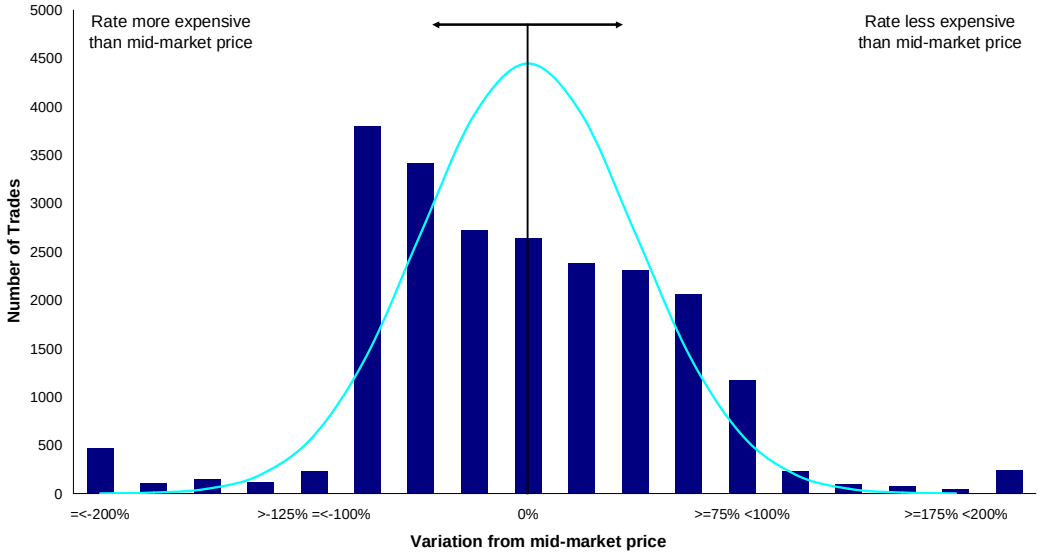


Chart 5.4 All spot non-market trades by number



Micro-trades

Micro-sized trades are frequently problematic, as the size is inefficient to trade within the FX markets. SBA incurred about $4.1 million in excess costs, or about 15.9 basis points of traded value; more than 6% of all micro-sized trades were executed outside the day's trading range, which is greater than our 2% expectation. BNY Mellon executions contributed more than $4.1 million of excess cost, or about 20.2 basis points. These internal contract types also accounted for more than 95% of the 3,300+ trades executed outside the day's trading range. SBA should discuss these results with BNY Mellon. In our experience, poor custodian execution often derives from their auto-repatriation process. SBA may wish to pay particular attention to BNY Mellon's auto-repatriation controls and to establish benchmark criteria for these trades.

External micro-sized executions added $69,000 in excess benefit, or 1.3 basis points, and executed about 2% of trades outside the day's trading range, which is within our expectations for the trade size.

Chart 5.5 All spot micro-trades by value

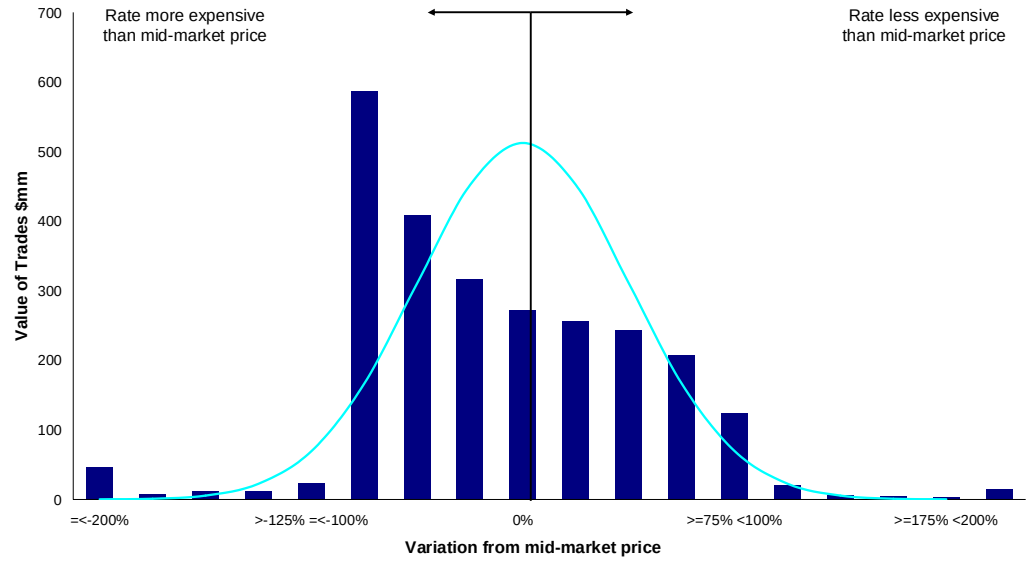
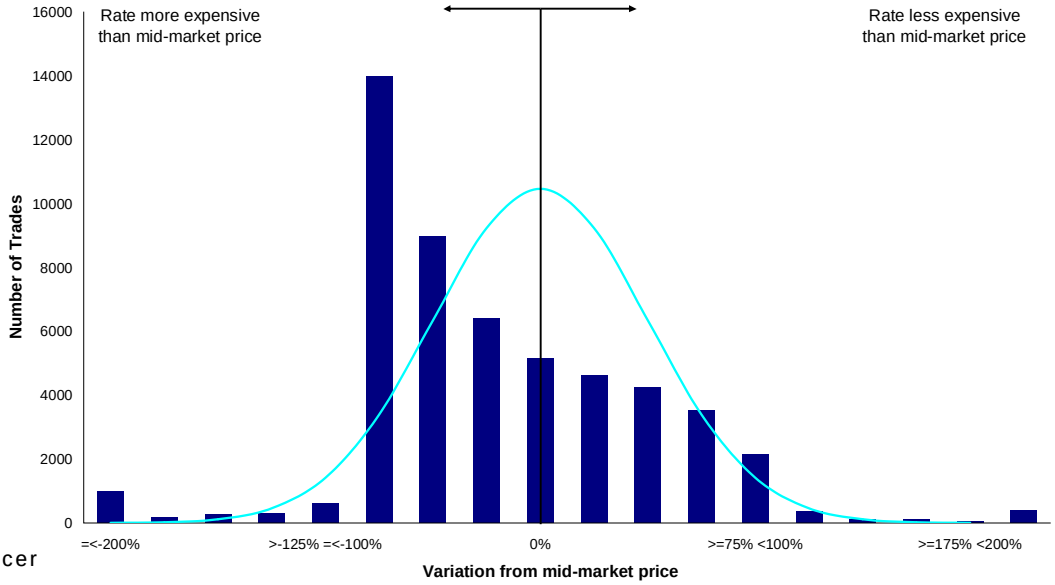


Chart 5.6 All spot micro-trades by number



6

Currency pair analysis

The table below shows the ten most frequently traded currency pairs across spot trades. These ten currency pairs represent 77% of all trades by frequency and 74% by volume traded. Of the top ten currency pairs, only JPY and AUD executions resulted in excess benefits. South Korean won (KRW) and Brazilian real (BRL) executions were excessively poor and require discussion with BNY Mellon regarding non-negotiated executions.

Table 6.1 Top 10 frequently traded spot currency pairs

Currency pairs	# of trades	Value traded in USD (000's)	%Disadv. by number	% within days range by number	Excess (cost) / benefit USD (000's)	Excess (cost) / benefit bps relative to traded value
USDEUR	20,089	11,975,096	68%	99%	(3,661)	(3.1)
JPYUSD	12,126	6,190,401	59%	99%	554	0.9
USDGBP	11,664	6,027,324	68%	99%	(1,985)	(3.3)
CADUSD	7,620	1,922,487	72%	98%	(1,026)	(5.3)
HKDUSD	5,689	2,811,279	58%	91%	(43)	(0.2)
AUDUSD	4,232	1,313,018	62%	97%	627	4.8
CHFUSD	3,719	2,608,889	68%	99%	(1,606)	(6.2)
KRWUSD	3,580	2,491,526	61%	54%	(4,133)	(16.6)
BRLUSD	2,796	1,238,157	85%	91%	(5,309)	(42.9)
SGDUSD	2,440	610,326	61%	98%	(132)	(2.2)
Total	***73,955***	***37,188,502***	***66%***	***96%***	***(16,714)***	***(4.5)***

Euro

The euro is a free-floating, reserve currency used by 16 of 27 countries in the European Union, including Austria, Belgium, Cyprus, Finland, France, Germany, Greece, Ireland, Italy, Luxemburg, Malta, the Netherlands, Portugal, Slovakia, Slovenia, and Spain. The currency market for the euro is liquid.

SBA's investment managers traded about $12.0 billion in euro currency, and incurred $3.7 million in excess costs, or 3.1 basis points of traded value. About 1% of these executions were outside the day's trading range, which is within our expectations. Sixty percent of all executions were euro purchases (by number), which incurred 4.4 basis points in excess costs. Micro-sized trades were particularly costly at 19.5 basis points of traded value, or $1.1 million.

BNY Mellon, non-negotiated contract types executed about 52% of all euro trades, and cost more than 24.7 basis points. This cost is excessive for such a liquid currency; BNY Mellon should explain the reason for incurring such high costs. Only internal negotiated and external contract types accumulated excess benefits: 0.1 basis points and 2.3 basis points, respectively.

Table 6.2 All spot trades in USD/EUR currency pairs

	Total	Buy	Sell
Total value of all trades, $000's	11,975,096	6,588,721	5,386,375
Excess benefit (+)/cost (-), $000's	(3,661)	(2,892)	(769)
Benefit (+)/cost (-), bps	(3.1)	(4.4)	(1.4)
Total number of trades	20,089	12,135	7,954
Number with excess costs	13,670	8,849	4,821
Percentage disadvantageous by number	68%	73%	61%
Value of disadvantageous, $000's	6,338,113	3,572,936	2,765,177
Percentage disadvantageous by value	53%	54%	51%
	Market	Non-Market	Micro
Total number	4,350	4,143	11,596
Benefit (+)/cost (-), bps	(1.2)	(12.1)	(19.5)
Percentage disadvantageous by number	53%	66%	75%

Chart 6.1 All spot trades by value in USD/EUR currency pairs

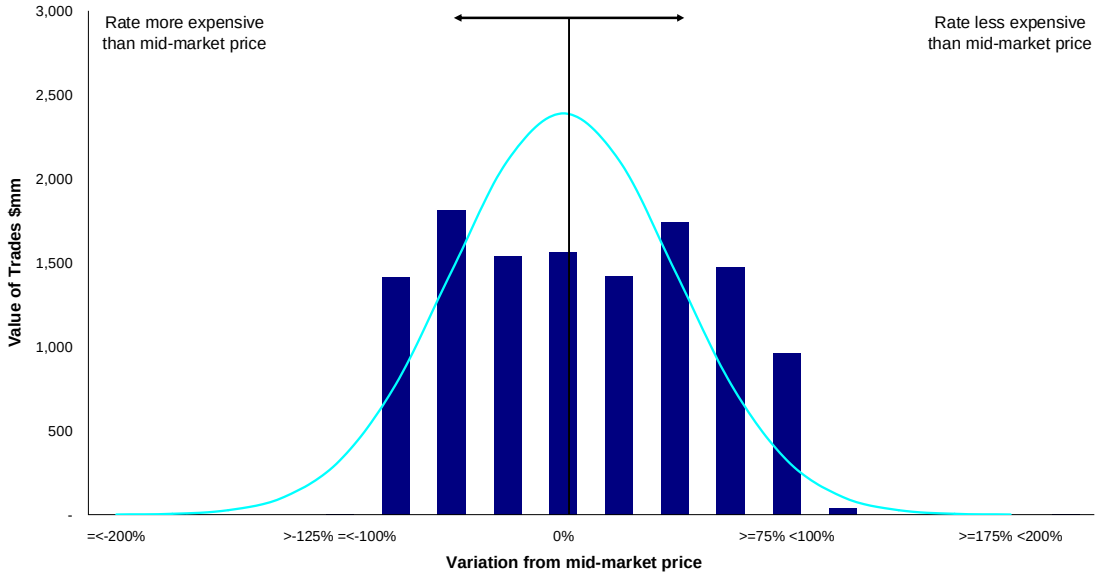
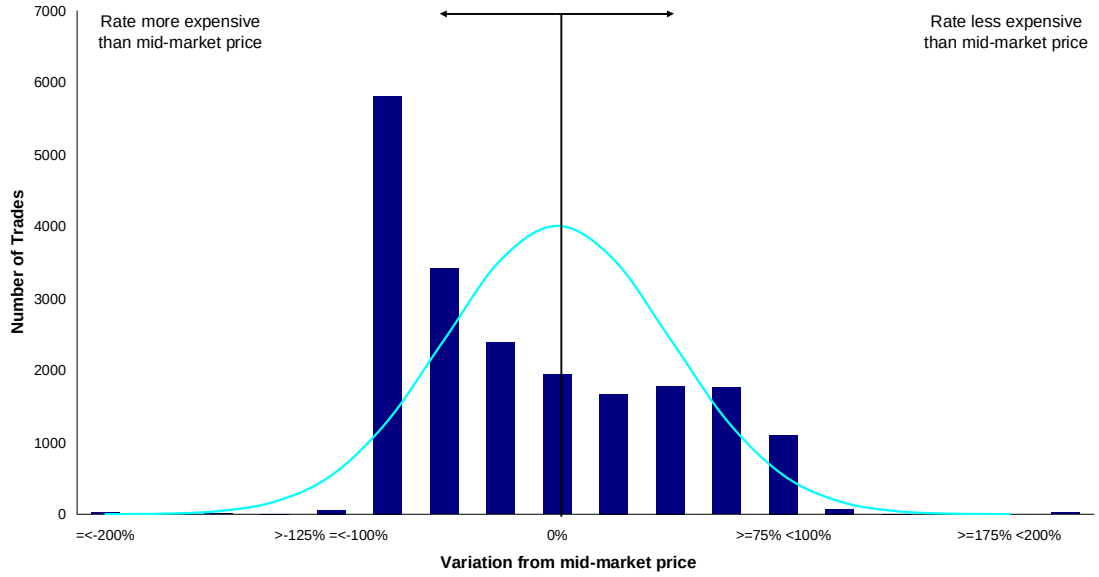


Chart 6.2 All spot trades by number in USD/EUR currency pairs



Japanese yen

The Japanese yen (JPY) is a free-floating, reserve currency with no government restrictions. The currency market for JPY is liquid.

SBA's investment managers traded more about $6.2 billion in yen currency, and gained about $554,000 in excess benefit, or 0.9 basis points of traded value. About 1% of these executions were outside the day's trading range, which is within our expectations. Forty-one percent of all executions were yen sales, which accumulated about 1.4 basis points in excess benefits. Micro-sized trades, however, were particularly costly at 9.5 basis points of traded value, or about $328,000.

BNY Mellon, non-negotiated contract types executed about 37% of all yen trades, and cost more than 22.2 basis points. All other aggregated contract types gained excess benefits. Internal negotiated accounted for 34% of all trades and gained 1.8 basis points. External executions were about 29% of all yen trades and gained 5.7 basis points of excess benefits.

Table 6.3 All spot trades in JPY/USD currency pairs

	Total	Buy	Sell
Total value of all trades, $000's	6,190,401	3,057,741	3,132,660
Excess benefit (+)/cost (-), $000's	554	102	452
Benefit (+)/cost (-), bps	0.9	0.3	1.4
Total number of trades	12,126	7,129	4,997
Number with excess costs	7,167	4,576	2,591
Percentage disadvantageous by number	59%	64%	52%
Value of disadvantageous, $000's	2,957,710	1,523,134	1,434,577
Percentage disadvantageous by value	48%	50%	46%
	Market	Non-Market	Micro
Total number	2,597	2,306	7,223
Benefit (+)/cost (-), bps	2.5	(6.5)	(9.5)
Percentage disadvantageous by number	49%	56%	64%

Chart 6.3 All spot trades by value in JPY/USD currency pairs

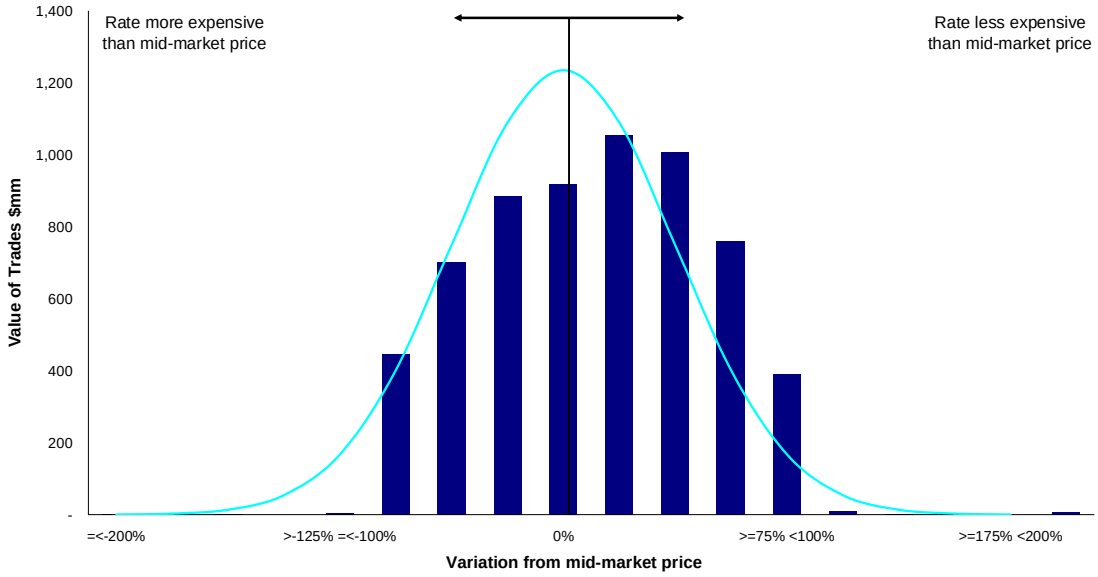
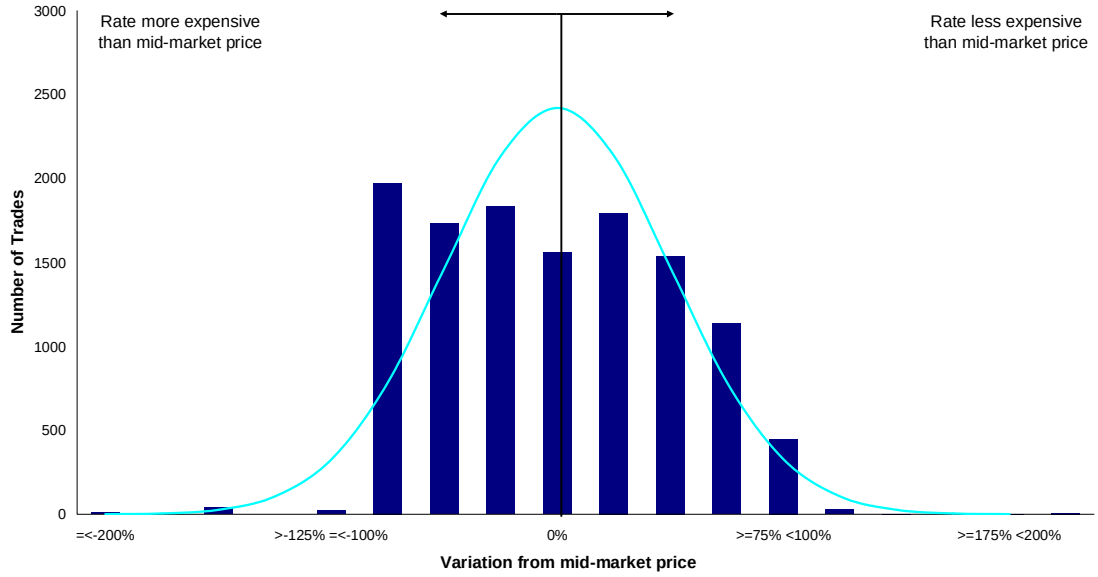


Chart 6.4 All spot trades by number in JPY/USD currency pairs



British pound sterling

The British pound sterling (GBP or pound) is a free-floating, reserve currency with no government restrictions. The GBP currency market is liquid.

SBA's investment managers traded more about $6.0 billion in pound currency, and had about $2.0 million in excess costs, or 3.3 basis points of traded value. About 1% of these executions were outside the day's trading range, which is within our expectations. Fifty-six percent of all executions were pound purchases, which accumulated about 4.0 basis points in excess costs. Micro-sized trades, however, were particularly costly at 20.0 basis points of traded value, or about $725,000.

BNY Mellon, non-negotiated contract types executed about 53% of all pound trades, and cost more than 22.7 basis points. This cost is excessive for such a liquid and widely available currency; BNY Mellon should explain the reason for incurring such high costs. Only external contract types accumulated excess benefits: 3.7 basis points.

Table 6.4 All spot trades in GBP/USD currency pairs

	Total	Buy	Sell
Total value of all trades, $000's	6,027,324	3,185,067	2,842,256
Excess benefit (+)/cost (-), $000's	(1,985)	(1,264)	(721)
Benefit (+)/cost (-), bps	(3.3)	(4.0)	(2.5)
Total number of trades	11,664	6,553	5,111
Number with excess costs	7,911	4,688	3,223
Percentage disadvantageous by number	68%	72%	63%
Value of disadvantageous, $000's	3,273,990	1,713,604	1,560,386
Percentage disadvantageous by value	54%	54%	55%
	Market	Non-Market	Micro
Total number	2,372	2,427	6,865
Benefit (+)/cost (-), bps	(0.9)	(12.1)	(20.4)
Percentage disadvantageous by number	52%	64%	74%

Chart 6.5 All spot trades by value in GBP/USD currency pairs

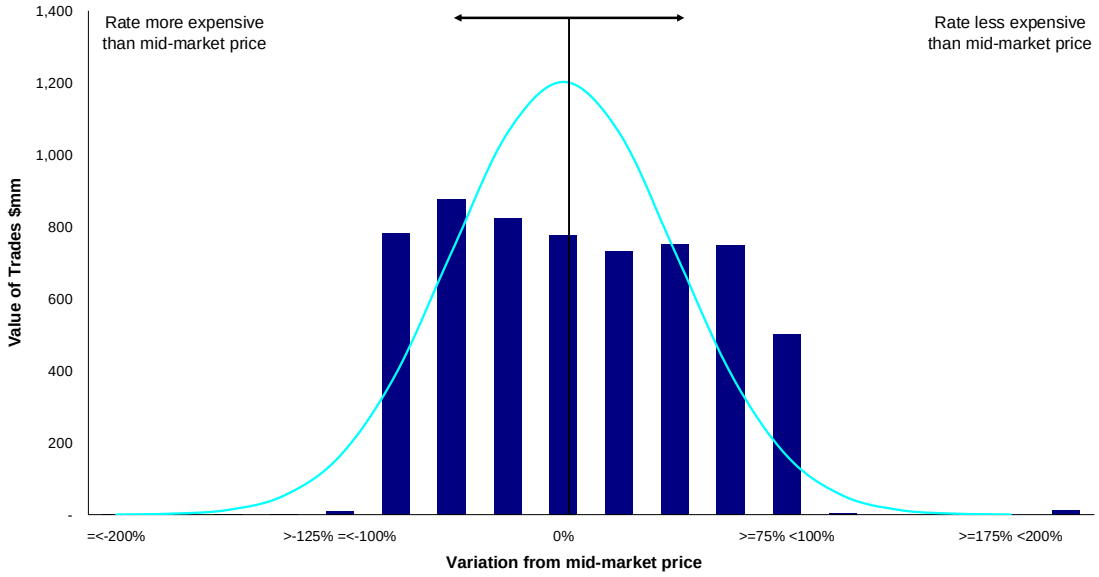
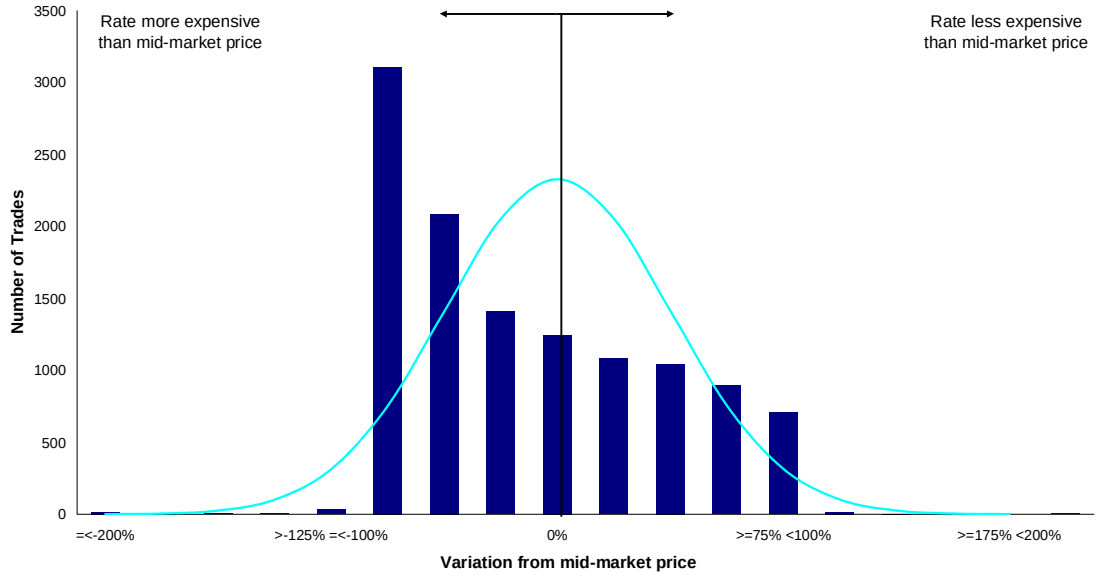


Chart 6.6 All spot trades by number in GBP/USD currency pairs



Canadian dollar

The Canadian dollar (CAD) is a free-floating, reserve currency with no government restrictions. The CAD currency market is liquid.

SBA's investment managers traded more about $1.9 billion in CAD, and had about $1.0 million in excess costs, or 5.3 basis points of traded value. About 2% of these executions were outside the day's trading range, which is within our expectations. Forty-one percent of all executions were CAD sells, which accumulated about 7.9 basis points in excess costs. Micro-sized trades, however, were particularly costly at 19.1 basis points of traded value, or about $383,000.

BNY Mellon, non-negotiated contract types executed about 57% of all CAD trades, and cost more than 40.8 basis points – or $1.9 million – in excess costs. This cost is excessive for such a liquid currency; BNY Mellon should explain the reason for incurring such high costs. Only internal negotiated and external contract types accumulated excess benefits: 6.3 basis points in excess benefits for both contract types.

Table 6.5 All spot trades in CAD/USD currency pairs

	Total	Buy	Sell
Total value of all trades, $000's	1,922,487	972,282	950,204
Excess benefit (+)/cost (-), $000's	(1,026)	(275)	(751)
Benefit (+)/cost (-), bps	(5.3)	(2.8)	(7.9)
Total number of trades	7,620	4,513	3,107
Number with excess costs	5,462	3,323	2,139
Percentage disadvantageous by number	72%	74%	69%
Value of disadvantageous, $000's	1,048,777	488,190	560,587
Percentage disadvantageous by value	55%	50%	59%
	Market	Non-Market	Micro
Total number	852	1,789	4,979
Benefit (+)/cost (-), bps	1.9	(18.1)	(19.1)
Percentage disadvantageous by number	54%	67%	76%

Chart 6.7 All spot trades by value in CAD/USD currency pairs

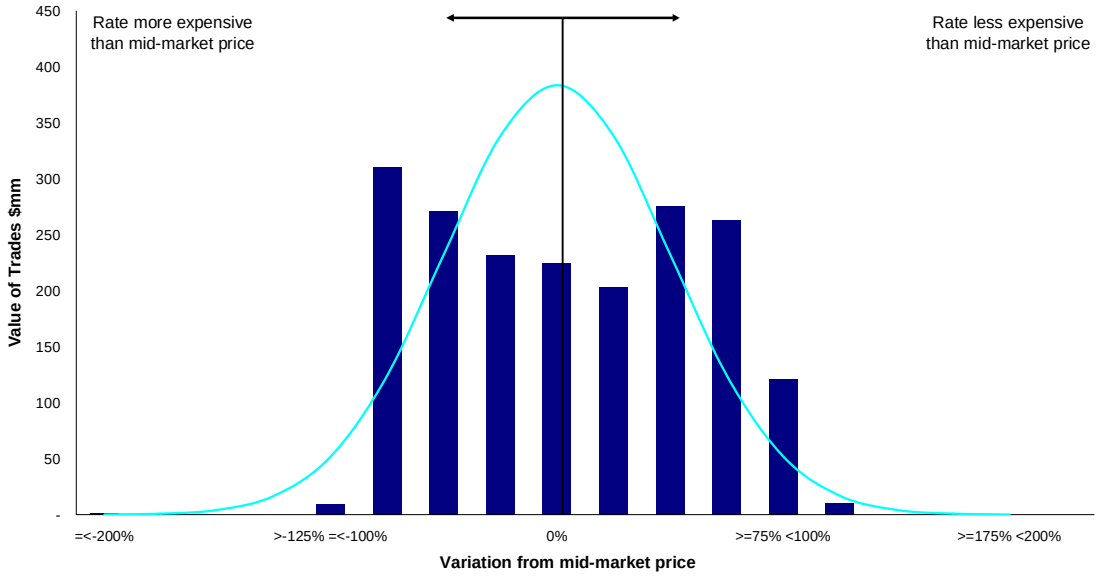
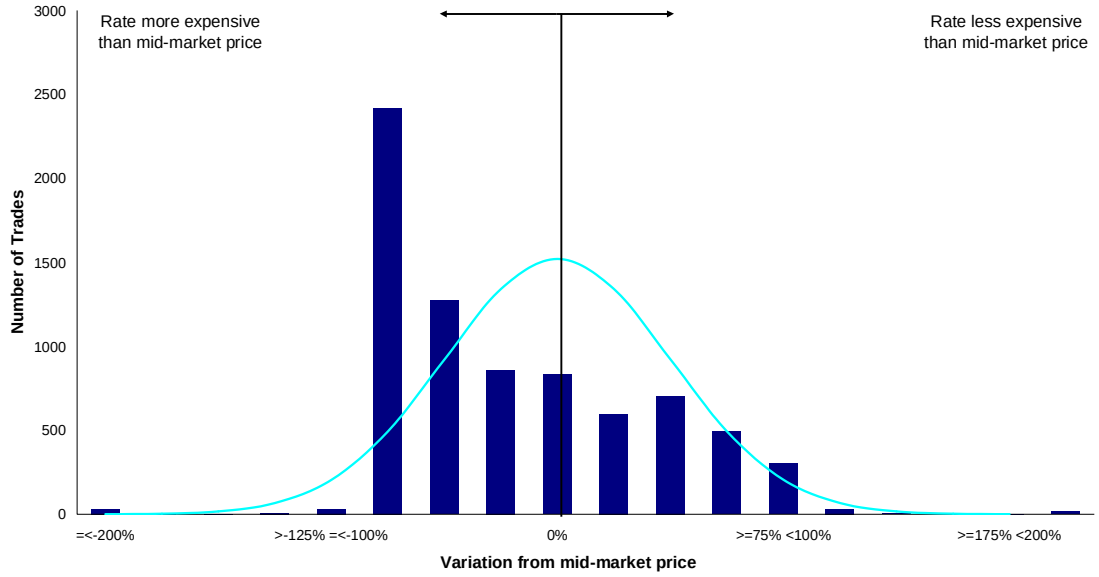


Chart 6.8 All spot trades by number in CAD/USD currency pairs



Hong Kong dollar

The Hong Kong dollar (HKD) is a USD-pegged, secondary currency. Since 2005, the HKD has been pegged to the USD to trade within HKD 7.75 to HKD 7.85. The HKD currency market is liquid.

SBA's investment managers traded more about $2.8 billion in HKD, and had about $43,000 in excess costs, or 0.2 basis points of traded value, which is well within our expectations for the currency. About 9% of these executions were outside the day's trading range, which is unexpected for HKD. Both internal and external contract types realized about 9% of total executions outside the day's trading range. Of the internal executions, about 96% were associated with the Pittsburgh trading desk (contract types T and X). Possible explanations for the out-of-day-range results include: 1) an accounting time-zone entry difference between the Hong Kong and Pittsburgh locations, or 2) a systemic control issue at the Pittsburgh treasury desk. In any case, BNY Mellon should investigate and explain the reason for the excessive trades outside the day's range.

Fifty-three percent of all HKD executions were purchases, which accumulated about 0.1 basis points in excess costs. Even micro-sized trades were within a reasonable pricing range: 0.6 basis points of excess cost. BNY Mellon, non-negotiated contract types executed about 39% of all HKD trades, and cost 1.2 basis points – or about $34,000 – in excess costs. This cost is reasonable for HKD. Only external contract types accumulated excess benefits: 0.2 basis points.

Table 6.6 All spot trades in HKD/USD currency pairs

	Total	Buy	Sell
Total value of all trades, $000's	2,811,279	1,259,433	1,551,845
Excess benefit (+)/cost (-), $000's	(43)	(17)	(26)
Benefit (+)/cost (-), bps	(0.2)	(0.1)	(0.2)
Total number of trades	5,689	3,032	2,657
Number with excess costs	3,291	1,912	1,379
Percentage disadvantageous by number	58%	63%	52%
Value of disadvantageous, $000's	1,473,499	666,733	806,767
Percentage disadvantageous by value	52%	53%	52%
	Market	Non-Market	Micro
Total number	1,207	1,306	3,176
Benefit (+)/cost (-), bps	(0.1)	(0.3)	(0.6)
Percentage disadvantageous by number	51%	52%	63%

Chart 6.9 All spot trades by value in HKD/USD currency pairs

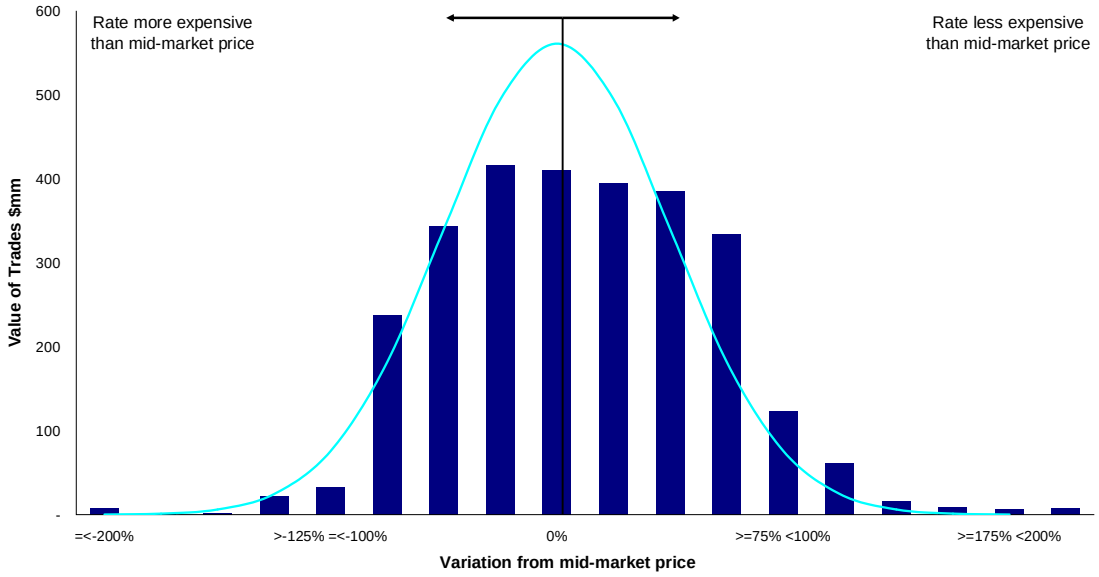
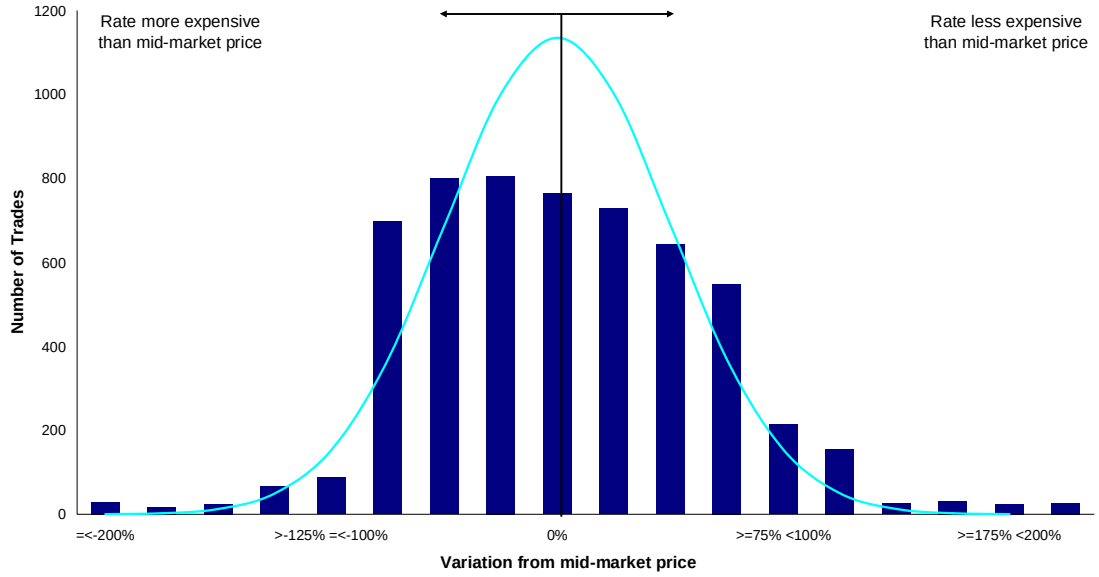


Chart 6.10 All spot trades by number in HKD/USD currency pairs



Australian dollar

The Australian dollar (AUD) is a free-floating, secondary currency with no government restrictions. The AUD market is liquid.

SBA's investment managers traded more about $1.3 billion in AUD, and had about $627,000 in excess benefits, or 4.8 basis points of traded value. About 3% of these executions were outside the day's trading range, which is slightly more than our expectations. Sixty-one percent of all executions were AUD purchases, which accumulated about 5.2 basis points in excess benefits. Micro-sized trades, however, were costly at 9.7 basis points of traded value, or about $114,000.

External brokers executed the greatest portion of AUD trades: about 42% by frequency. These executions resulted in about 12.8 basis points of excess benefit, or $1.1 million. All internal contract types realized excess costs. BNY Mellon, non-negotiated contract types executed about 38% of all AUD trades, and cost more than 25.8 basis points – or $384,000 – in excess costs. These costs are excessive for such a liquid currency; BNY Mellon should explain the reason for incurring such high costs.

Table 6.7 All spot trades in AUD/USD currency pairs

	Total	Buy	Sell
Total value of all trades, $000's	1,313,018	684,051	628,966
Excess benefit (+)/cost (-), $000's	627	358	269
Benefit (+)/cost (-), bps	4.8	5.2	4.3
Total number of trades	4,232	2,565	1,667
Number with excess costs	2,612	1,659	953
Percentage disadvantageous by number	62%	65%	57%
Value of disadvantageous, $000's	643,098	289,882	353,216
Percentage disadvantageous by value	49%	42%	56%
	Market	Non-Market	Micro
Total number	545	1,027	2,660
Benefit (+)/cost (-), bps	9.4	(4.0)	(9.7)
Percentage disadvantageous by number	48%	54%	68%

Chart 6.11 All spot trades by value in AUD/USD currency pairs

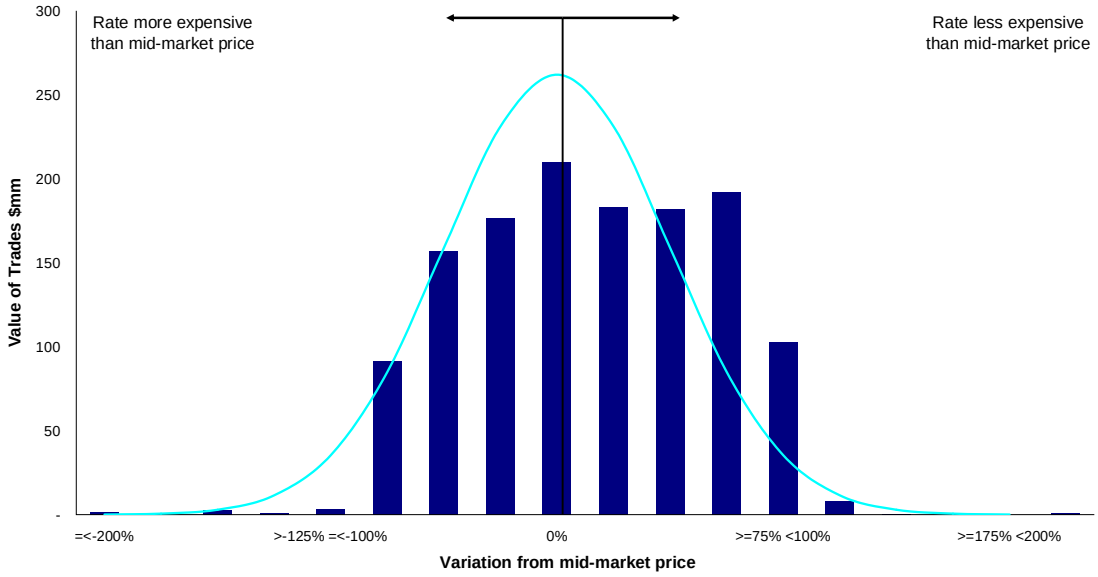
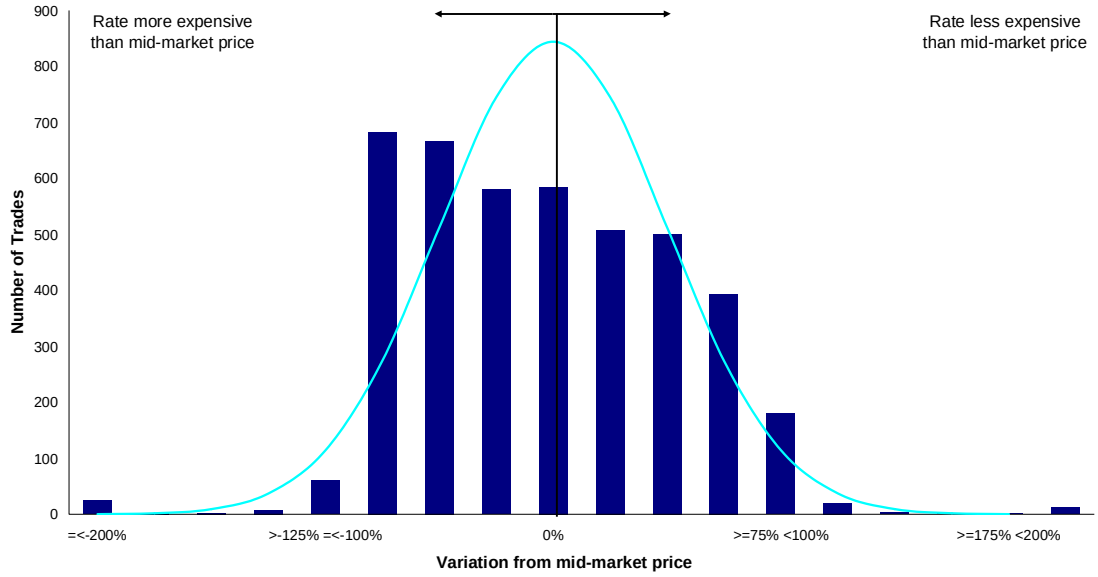


Chart 6.12 All spot trades by number in AUD/USD currency pairs



Swiss franc

The Swiss franc (CHF) is a free-floating, reserve currency with no government restrictions. The CHF currency market is liquid.

SBA's investment managers traded more about $2.6 billion in CHF, and had about $1.6 million in excess costs, or 6.2 basis points of traded value. About 1% of these executions were outside the day's trading range, which is within our expectations. Forty percent of all executions were CHF sells, which accumulated about 6.6 basis points in excess costs. Micro-sized trades were particularly costly at 23.5 basis points of traded value, or about $233,000.

BNY Mellon, non-negotiated contract types executed about 49% of all CHF trades, and incurred 27.4 basis points – or $1.3 million – in excess costs. This cost is excessive for such a liquid currency; BNY Mellon should explain the reason for incurring such high costs. Only external contract types were within a reasonable cost range: about 0.7 basis points, or $90,000, of excess costs.

Table 6.8 All trades by all managers in CHF/USD currency pairs

	Total	Buy	Sell
Total value of all trades, $000's	2,608,889	1,318,573	1,290,316
Excess benefit (+)/cost (-), $000's	(1,606)	(756)	(850)
Benefit (+)/cost (-), bps	(6.2)	(5.7)	(6.6)
Total number of trades	3,719	2,240	1,479
Number with excess costs	2,541	1,617	924
Percentage disadvantageous by number	68%	72%	62%
Value of disadvantageous, $000's	1,494,277	763,337	730,940
Percentage disadvantageous by value	57%	58%	57%
	Market	Non-Market	Micro
Total number	1,069	815	1,835
Benefit (+)/cost (-), bps	(4.8)	(12.7)	(23.5)
Percentage disadvantageous by number	56%	66%	76%

Chart 6.13 All trades by value for all managers in CHF/USD currency pairs

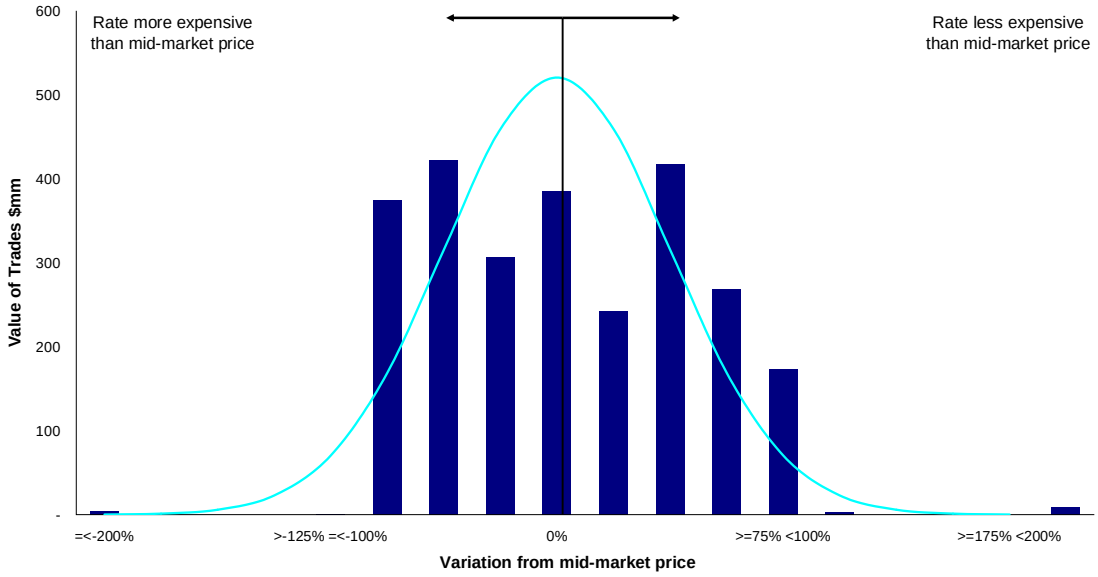
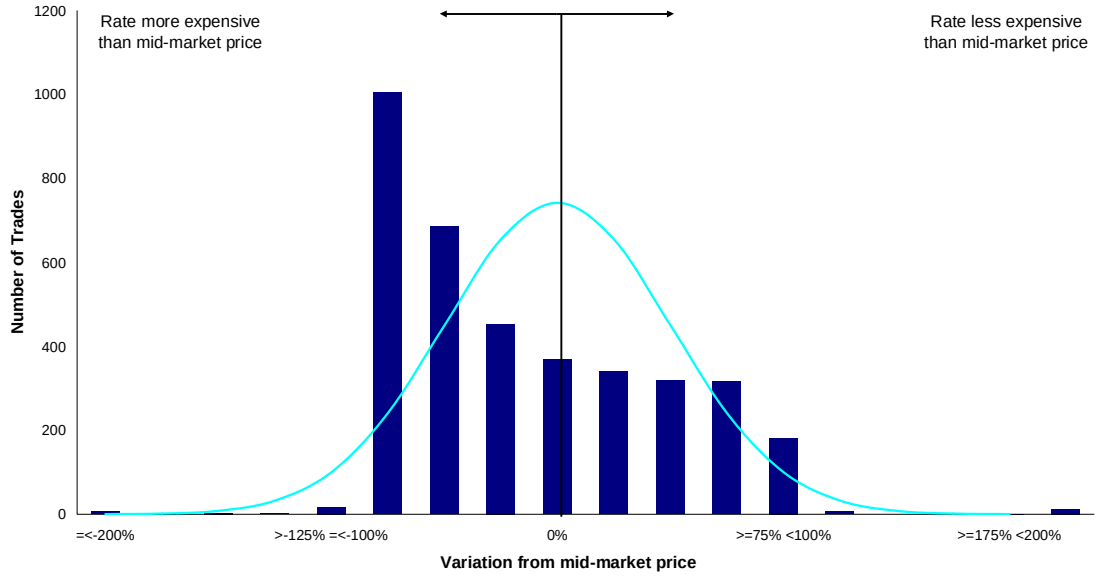


Chart 6.14 All trades by number for all managers in CHF/USD currency pairs



South Korean won

The South Korean won (KRW) is a managed currency with government restrictions. All FX associated with security transactions must be executed onshore through a registered local dealer. A segregated offshore market exists, but purchases are not freely convertible into South Korea for investment purposes.

SBA's investment managers traded more about $2.5 billion in won, and had about $4.3 million in excess costs, or 16.6 basis points of traded value. About 46% of these executions were outside the day's trading range, which is widely outside our 2% expectation for the currency – even with restrictions. Forty-four percent of all executions were won sells, which accumulated about 23.2 basis points in excess costs. All trade sizes were costly; micro-sized trades were particularly costly at 30.6 basis points of traded value, or about $191,000.

BNY Mellon sub-custodian, non-negotiated contract types executed about 61% of all won trades, but cost only 3.6 basis points – or $593,000 – in excess costs, which is reasonable given the local restrictions. BNY Mellon, non-negotiated contract types accumulated the majority of excess costs: about 43.0 basis points, or $3.5 million. This cost is excessive for the currency; BNY Mellon should explain the reason for incurring such high costs from non-negotiated executions. Internal, negotiated and external contract types lacked sufficient records to draw statistically significant conclusions about their results.

Table 6.9 All spot trades in KRW/USD currency pairs

	Total	Buy	Sell
Total value of all trades, $000's	2,491,526	1,207,786	1,283,740
Excess benefit (+)/cost (-), $000's	(4,133)	(1,155)	(2,978)
Benefit (+)/cost (-), bps	(16.6)	(9.6)	(23.2)
Total number of trades	3,580	2,005	1,575
Number with excess costs	2,169	1,277	892
Percentage disadvantageous by number	61%	64%	57%
Value of disadvantageous, $000's	1,429,060	723,543	705,517
Percentage disadvantageous by value	57%	60%	55%
	Market	Non-Market	Micro
Total number	1,343	1,098	1,139
Benefit (+)/cost (-), bps	(15.0)	(24.5)	(30.6)
Percentage disadvantageous by number	60%	60%	61%

Chart 6.15 All spot trades by value in KRW/USD currency pairs

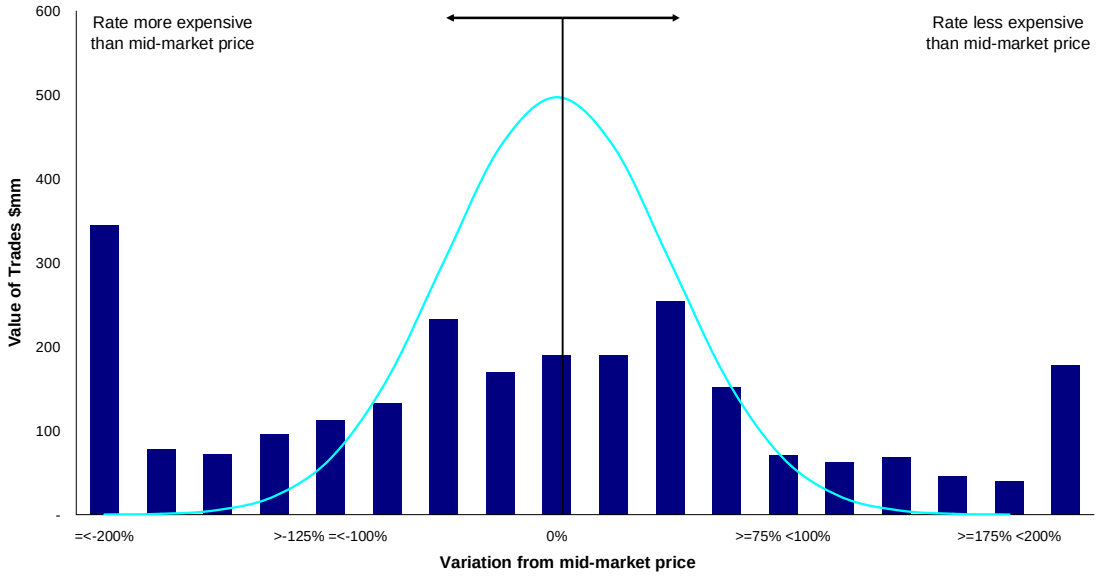
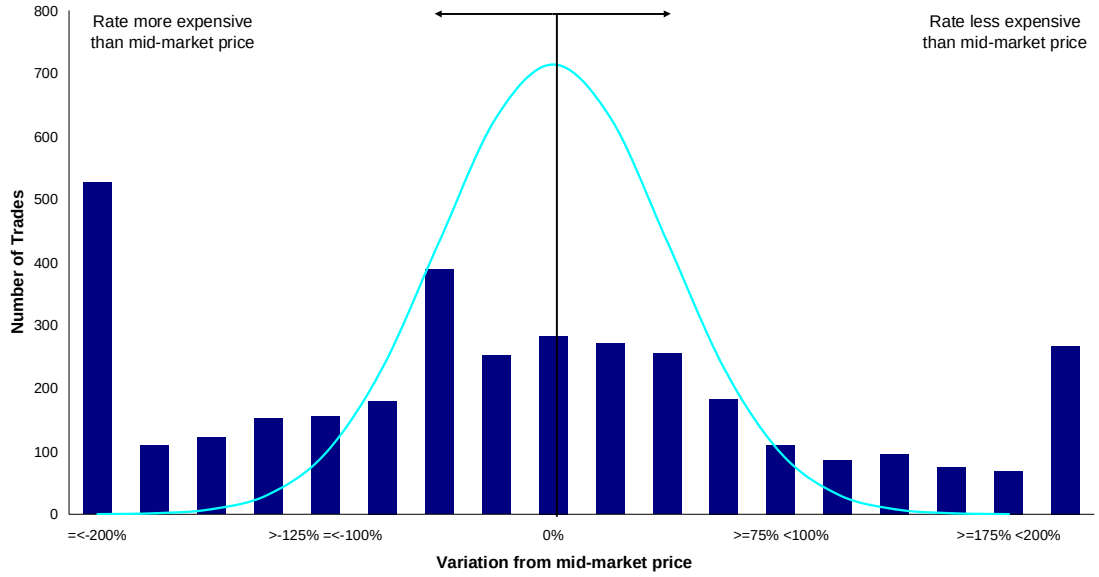


Chart 6.16 All spot trades by number in KRW/USD currency pairs



Brazilian real

The Brazilian real (BRL) is a managed floating currency, with government restrictions limiting the volatility of the currency. All FX associated with security transactions must be executed onshore through a registered local dealer. A segregated offshore market does not exist.

SBA's investment managers traded more about $1.2 billion in real, and had about $5.3 million in excess costs, or 42.9 basis points of traded value. About 9% of all executions were outside the day's trading range, which is greater than our expectation. Forty-eight percent of all executions were real sells, which accumulated about 47.6 basis points in excess costs. All trade sizes had excessive costs, incurring more than 42 basis points of cost in each trade-size category.

BNY Mellon, non-negotiated contract types executed about 95% of all real trades, and cost more than 44.3 basis points – or $5.4 million – in excess costs. This cost is excessive for such a currency; BNY Mellon should explain the reason for incurring such high costs. In total, internal, negotiated trades accumulated $54,000 in excess benefit, or about 64.3 basis points against traded value. Sub-custodian and external contract types lacked sufficient records to draw statistically significant conclusions.

Table 6.10 All spot trades in BRL/USD currency pairs

	Total	Buy	Sell
Total value of all trades, $000's	1,238,157	635,756	602,400
Excess benefit (+)/cost (-), $000's	(5,309)	(2,440)	(2,869)
Benefit (+)/cost (-), bps	(42.9)	(38.4)	(47.6)
Total number of trades	2,796	1,457	1,339
Number with excess costs	2,381	1,198	1,183
Percentage disadvantageous by number	85%	82%	88%
Value of disadvantageous, $000's	1,076,937	537,520	539,416
Percentage disadvantageous by value	87%	85%	90%
	Market	Non-Market	Micro
Total number	628	824	1,344
Benefit (+)/cost (-), bps	(42.5)	(44.4)	(42.9)
Percentage disadvantageous by number	84%	84%	86%

Chart 6.17 All spot trades by value in BRL/USD currency pairs

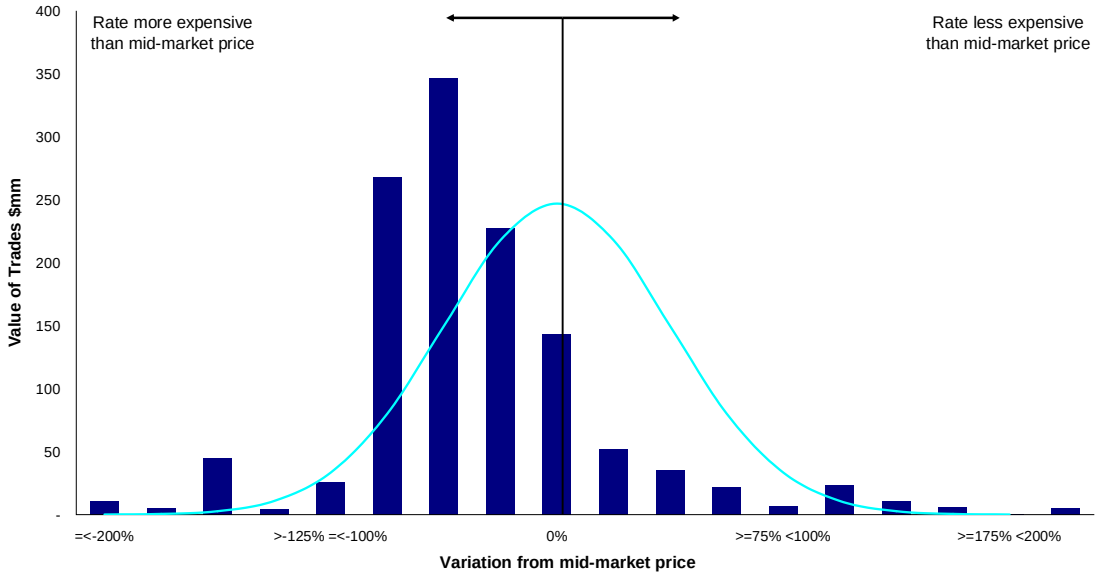
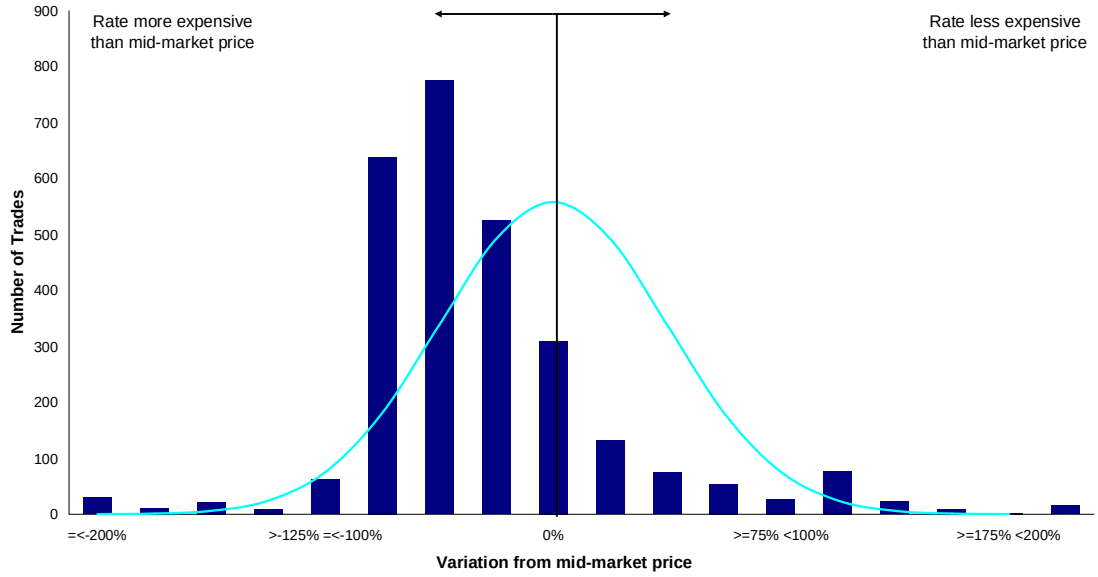


Chart 6.18 All spot trades by number in BRL/USD currency pairs



Singaporean dollar

The Singapore dollar (SGD) is a free-floating, secondary currency with no government restrictions. The currency market for SGD is liquid.

SBA's investment managers traded about $610 million in SGD and had about $132,000 in excess costs, or 2.2 basis points of traded value. About 2% of these executions were outside the day's trading range, which is within our expectations. Sixty-one percent of all executions were SGD purchases, which accumulated about 2.9 basis points in excess costs. Non-market sized trades were the most costly at 4.9 basis points, or $156,000, which is reasonable for the currency.

Non-negotiated contract types executed about 43% of all SGD trades, and cost about 7.8 basis points – or $132,000 – in excess costs. This cost is somewhat high for the currency. Only external contract types accumulated excess benefits: 0.1 basis points in excess benefits, or $3,000.

Table 6.11 All spot trades in SGD/USD currency pairs

	Total	Buy	Sell
Total value of all trades, $000's	610,326	291,206	319,120
Excess benefit (+)/cost (-), $000's	(132)	(85)	(47)
Benefit (+)/cost (-), bps	(2.2)	(2.9)	(1.5)
Total number of trades	2,440	1,495	945
Number with excess costs	1,493	968	525
Percentage disadvantageous by number	61%	65%	56%
Value of disadvantageous, $000's	319,413	155,373	164,040
Percentage disadvantageous by value	52%	53%	51%
	Market	Non-Market	Micro
Total number	337	562	1,541
Benefit (+)/cost (-), bps	(0.8)	(4.9)	(3.5)
Percentage disadvantageous by number	52%	59%	64%

Chart 6.19 All spot trades by value in SGD/USD currency pairs

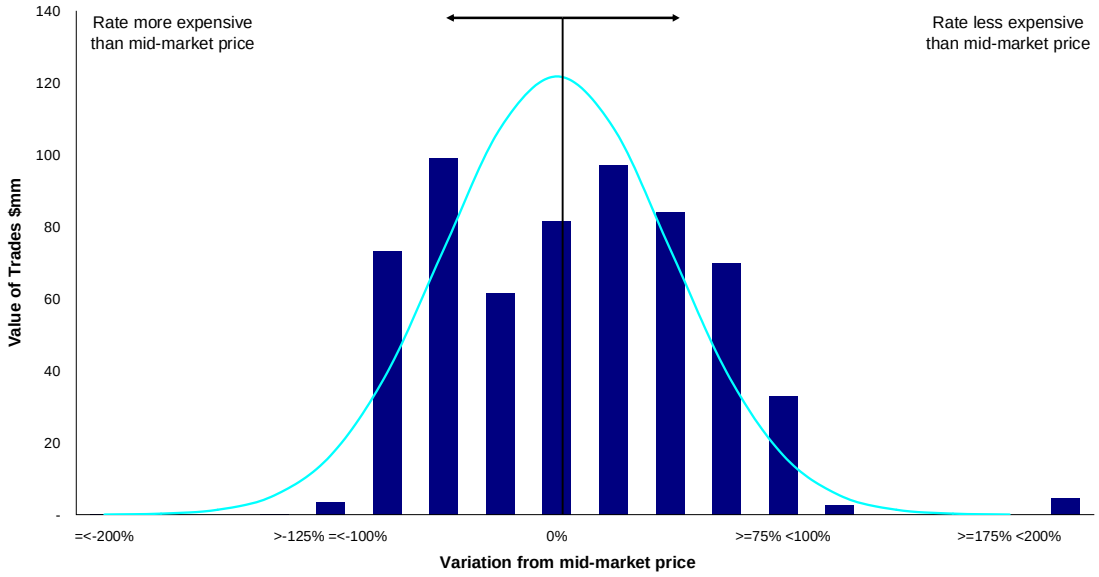
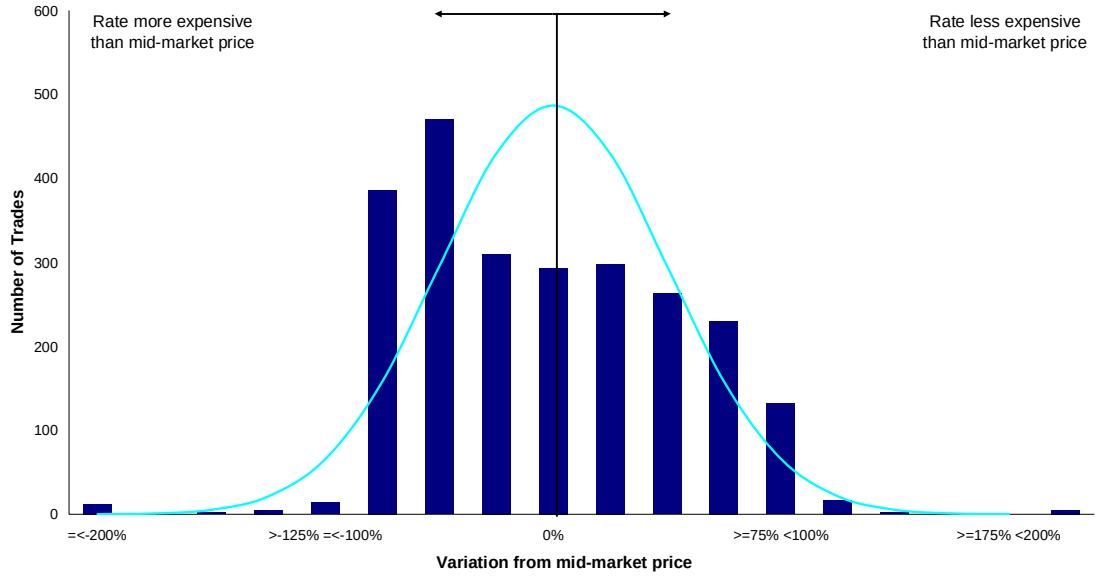


Chart 6.20 All spot trades by number in SGD/USD currency pairs



7

Forward execution analysis

Forward executions realized about $519,000, or about 0.4 basis points, of excess cost. As consistent with spot trades, internal contract types contributed most to excess costs: about $928,000, or 4.4 basis points. In contrast, external contract types contributed excess benefits: about $408,000, or 0.4 basis points. External trading brokers executed 98% of executions within the day's trading range, but only 92% of BNY Mellon's forward executions were inside the day's trading range, suggesting that BNY Mellon lacks effective forward execution controls.

Table 7.1 All forward executions by trade size

	Total	Market	Non-Market	Micro
Total value of all trades, $000's	12,789,201	12,228,969	398,892	161,341
Excess benefit (+)/cost (-), $000's	(519)	90	(396)	(213)
Benefit (+)/cost (-), bps	(0.4)	(0.1)	(9.9)	(13.2)
Total number of trades	5,910	1,761	1,427	2,722
Number with excess costs	3,358	874	824	1,660
Percentage disadvantageous by number	57%	50%	58%	61%
Value of disadvantageous, $000's	6,186,485	5,863,073	227,659	95,753
Percentage disadvantageous by value	48%	48%	57%	59%
% within days range (by value)	94%	94%	93%	94%
% within days range (by number)	94%	93%	93%	95%

Forward market trades

Market-sized forward executions resulted in excess benefits of about $90,000, or about 0.1 basis points against $12.2 billion traded. Overall, 7% of forward, market-sized trades were executed outside the day's traded range. Internal contract executions contributed 74% of the total 115 market-sized forward executions outside the day's trading range. External negotiated contracts executed about 55% of all forward market trades, and realized about 0.4 basis points of excess benefit. Internal, negotiated executed about 32% of all forward, market-sized trades, and realized about 0.3 basis points of excess costs. Internal, non-negotiated forward rates were about 10% of all forward executions and realized 17.0 basis points of excess cost, or $344,000.

Chart 7.1 All forward market sized trades by value

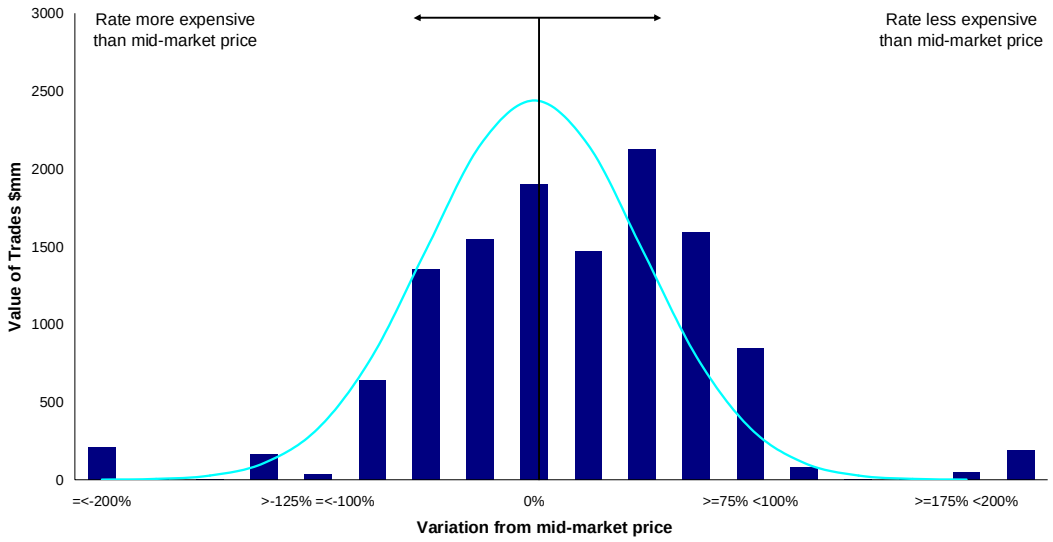
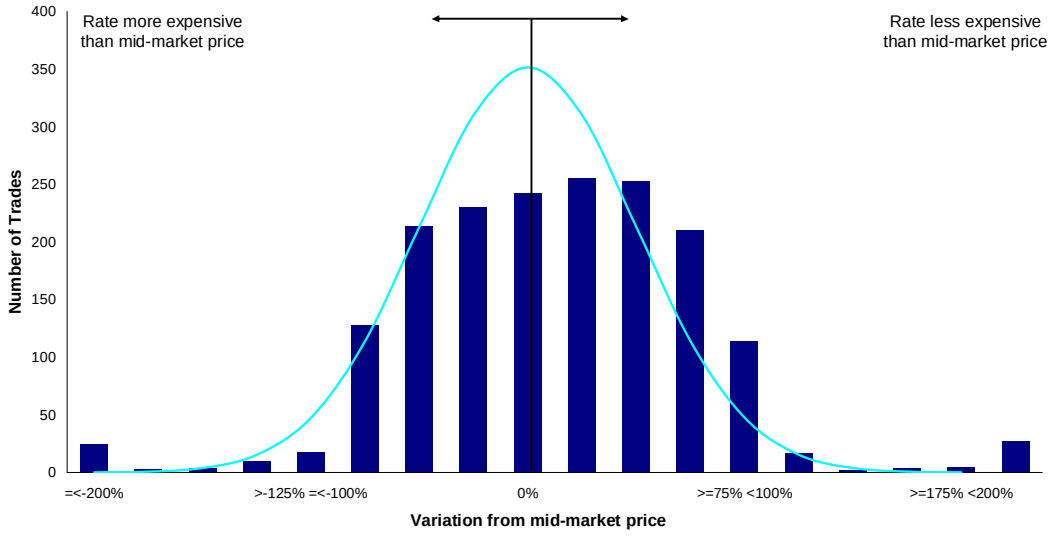


Chart 7.2 All forward market sized trades by number

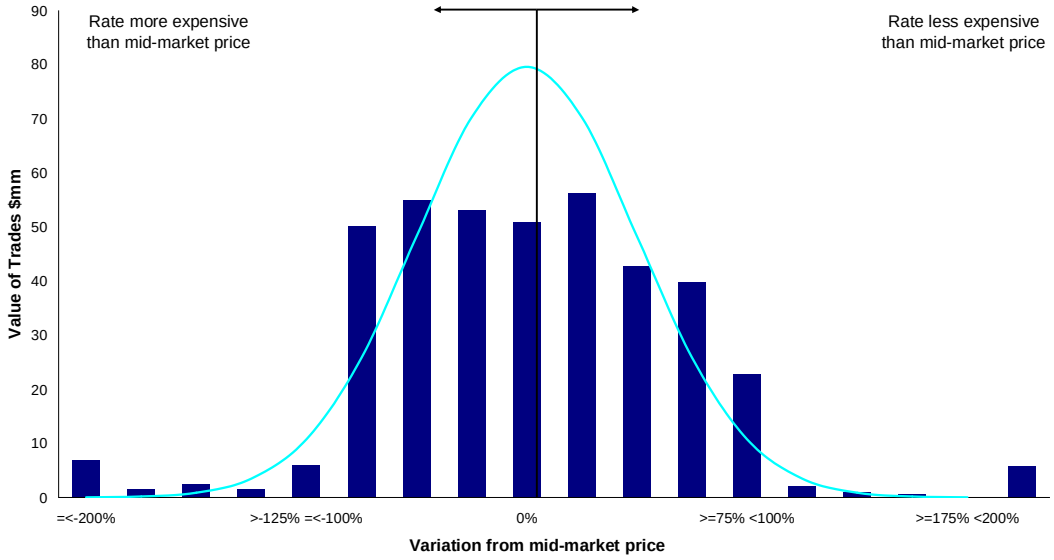


Forward non-market trades

SBA realized $396,000 in excess costs from forward, non-market sized executions, or about 9.9 basis points against $399 million traded. About 7% of forward, non-market sized executions were outside the day's trading range.[10] Internal contract executions contributed about 93% of forward, non-market sized executions outside the day's interpolated trading range.

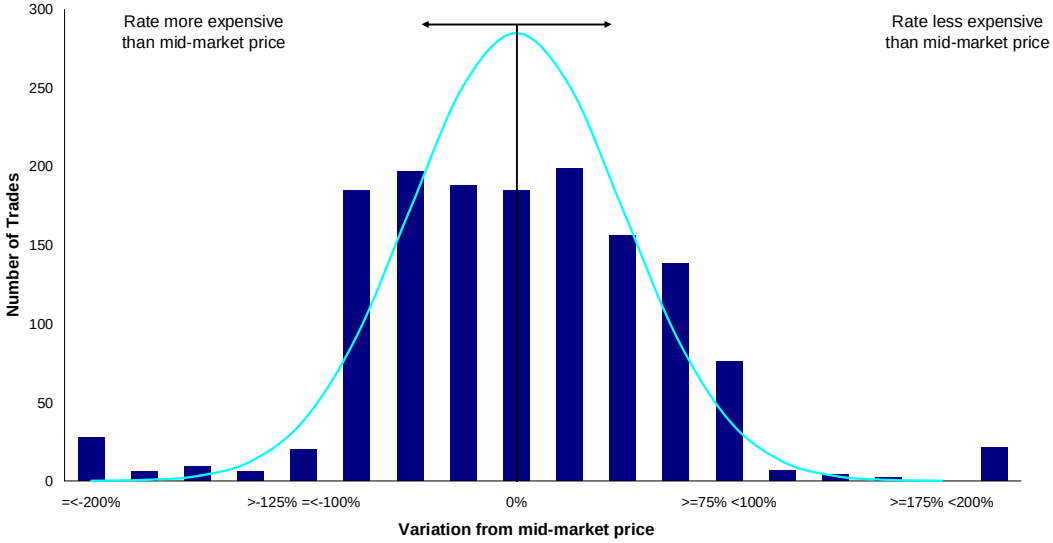
External negotiated contracts executed about 34% of all forward, non-market trades, and realized about 0.5 basis points of excess cost. About 1% of these external, non-market forward executions were outside the day's trading range. Internal, negotiated executed about 34% of all forward, non-market sized trades, as well, and realized about 3.4 basis points of excess costs. Internal, non-negotiated forward rates were about 28% of all forward executions and realized 33.0 basis points of excess cost, or $353,000.

Chart 7.3 All forward non-market sized trades by value



[10] BNY Mellon should comment on its forward execution controls; however, since we interpolate a day's range from near and far contracts (see Appendix for further details), SBA should bear in mind the percentage outside the day's range may be higher or lower than our estimate for all forward contract types.

Chart 7.4 All forward non-market sized trades by number



Forward micro-trades

Micro-sized, forward executions resulted in excess costs of about $213,000, or 13.2 basis points against $161 million traded. Overall, 5% of forward, micro-sized trades executed outside the day's traded range. Internal contract executions contributed about 96% of all forward, micro-sized executions outside the day's trading range. Internal, negotiated contracts executed about 40% of all forward, micro-sized trades, and realized about 1.7 basis points of excess benefit, or $11,000. Internal, non-negotiated contracts executed about 33% of all forward, market-sized trades, and realized about 45.7 basis points of excess costs, which BNY should explain. External, negotiated forward rates were about 24% of all forward, micro executions and realized 0.1 basis points of excess cost.

Chart 7.5 All forward micro sized trades by value

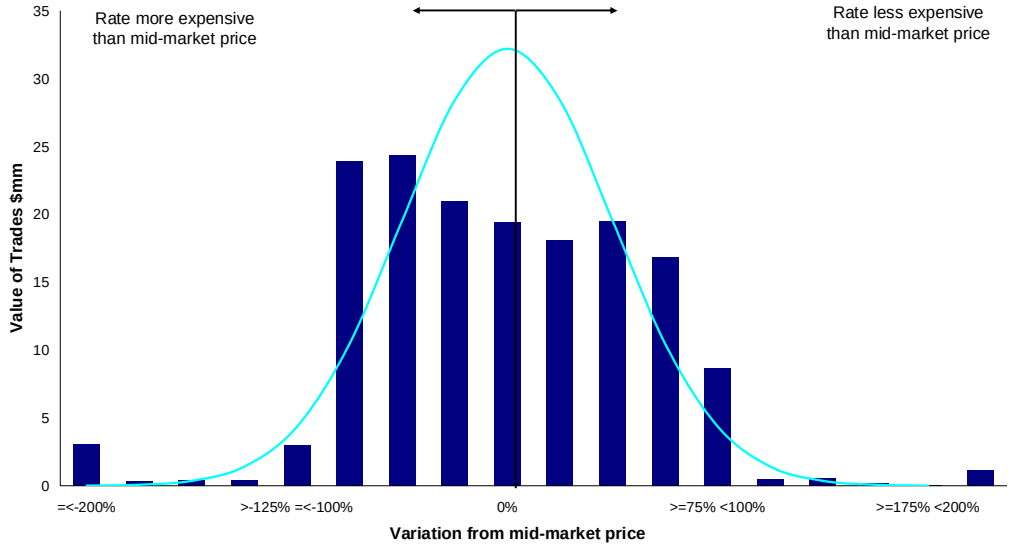
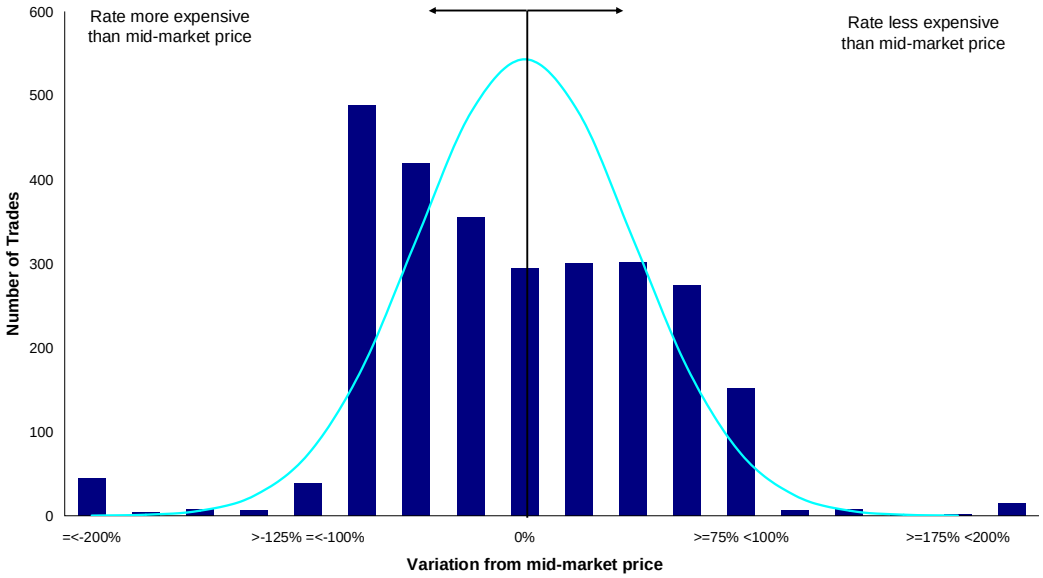


Chart 7.6 All forward micro sized trades by number



Appendix A

Foreign exchange transaction cost analysis methodology

There are two approaches to currency transaction cost analysis, depending on whether time-stamped trading data is available.

Time-stamped data

Where time of trade information is provided, a comparison is made between the actual price achieved and market prices available at or close to that time. Mercer Sentinel attains prices across a range of currencies every 15-minutes during market hours via Bloomberg pricing data. In a time-stamped analysis, we compare the traded price to the quoted market rate at the time of the trade, or a rate interpolated between the two nearest quoted prices on either side of the execution time. The results are presented graphically, grouping trades according to their variation from the interpolated rate ("market mid-price"). Effective trading would result in a tight grouping around the market mid-price with a bias to the less expensive side.

Price-makers can legitimately refuse to make general time-stamped data across their books available to third parties. However, custodians, acting as fiduciary agents for their clients, should be able to provide time-stamped trade data specific to the client. While it is common practice, it is poor internal control not to maintain time-stamped information.

Non time-stamped data

In some cases, custodians do not maintain time-stamped information, while in other cases, time-stamped information is not available on external systems. In such situations, Mercer Sentinel must base FX audit analyses on the intra-day market price ranges: the highest and lowest execution prices during the transaction day. Mercer Sentinel assumes US Eastern Time as the basis for a trading day. For each day, we review the price range and calculate the midpoint from the high offer and low bid. Then, we

compare the actual execution price against the midpoint and daily range to determine its divergence from an anticipated trade during that specific day. For instance, if GBP/USD daily price range was 1.5000 to 1.5100, we calculate the midpoint at 1.5050 (assuming no bid-offer spread). If a manager purchased GBP and sold USD at a rate of 1.5050, Mercer Sentinel considers the trade 0% off market. If the transaction occurs at 1.5060, we consider the difference between the execution and midpoint at 20% off market. In this example, the trade would be more expensive to the client, and thus measured at -20%. Additionally, Mercer Sentinel considers a trade greater than +100% or less than -100% outside the relevant day's relevant price range.

Estimating excess costs for non-time stamped data

Statistically, relative positions of individual trades provide little information in isolation. For instance, a transaction may lie at the expensive end of its day price range due to the particular execution time in the market and may not necessarily signify an uncompetitive transaction. A reasonably sized sample should distribute executions across the spectrum from -100% to +100%, and coverage to a normal distribution, where the midpoint price is zero. For a normal distribution to hold, one must assume that over time the intra-day pattern of market prices is random in nature and normally distributed. If these assumptions are correct, significant divergences from a normal trade execution distribution[11] over a portfolio of trades suggests that pricing has been systematically disadvantaged or advantaged.

Without adjusting for standard trading costs, such as bid-offer spreads, an FX analysis tends to produce a slight bias towards disadvantageous pricing. FX markets execute on a principal basis, with bid-offer spreads and generally no additional commissions. Bid-offer spreads mean that the price-taker pays for the price-makers services by purchasing at a higher price than it can sell to the price-maker at any particular time; thus, the price taker always incurs a slight disadvantage of the spread cost. Such a bias skews the trade execution distribution negatively, suggesting that the price-taker has received consistently non-competitive pricing.

To account for bid-offer spread, we adjust the rates traded by half the average bid-offer spread to reflect standing trading costs. The size of bid-offer spread adjustments vary among currency pairs, which we expect to be present on a typical competitive market-size trade. We calculate the bid-offer spread adjustment from quantitative historical data, and qualitative market experience.

Certain currency pairs in our analysis for SBA do not have significant bid-offer spread information. As agreed with SBA, we isolated these currencies and make special reference in the report where this absence of information materially affects our analysis.

[11] A normal distribution is symmetrical around the median and the number of observations gradually reduce as one moves away from the median. We would expect the median observation to be close to 0%.

Trading pattern analysis

BNY Mellon's FX data did not include execution time-stamps, and hence, we have analyzed the data on a day-range basis. Mercer Sentinel considered the general number and value of spot and forward trades analyzed sufficient to make use of the day-range methodology.

While interpreting our report, it is important to bear in mind that Mercer Sentinel evaluated trades based on divergence from the day's market midpoint. Execution on the negative side of the market midpoint incurs a cost to SBA. Execution on the positive side of the market midpoint delivers a benefit to SBA.

For example, during a currency purchase, if we found the trade to be 0% off market, then the trade was executed at the day's midpoint. If the purchase is +100% off the day's midpoint, the buy was executed at the day's low and, therefore, favorable to SBA; and -100% off the day's midpoint indicates a purchase at the day's high and, therefore, unfavorable to SBA.

Appendix B

Individual account results[12]

Table A1 Individual account results for SBA's foreign equity separately managed accounts

Accounts	Trades		% disadvantageous by value				Excess (cost) / benefit	
	Volume in # of trades	Volume in USD (000's)	Total	Market	Non-market	Micro	USD (000's)	Bps of traded value
Trilogy Global	2,399	1,245,134	46%	44%	54%	65%	216	1.7
Acadian Global	1,407	1,210,599	54%	54%	54%	57%	(602)	(5.0)
Fisher Inv Global	882	609,090	72%	71%	61%	92%	(864)	(14.2)
Templeton Global	1,856	802,042	56%	54%	61%	75%	(461)	(5.8)

[12] The analysis does not consider SBA's foreign currency exposure through its commingled investment accounts, which represented approximately 22% (as of 30 June 2010) of SBA's total international and global equity assets.

Accounts	Trades		% disadvantageous by value				Excess (cost) / benefit	
	Volume in # of trades	Volume in USD (000's)	Total	Market	Non-market	Micro	USD (000's)	Bps of traded value
McLean Budden	637	1,112,718	43%	43%	39%	54%	537	4.8
UBS Global	670	1,433,468	53%	53%	46%	61%	442	3.1
Walter Scott	414	514,550	60%	59%	57%	80%	(247)	(4.8)
Bank of Ireland Global	364	614,719	49%	48%	52%	86%	120	2.0
Acadian Long	1,349	1,390,164	51%	50%	61%	61%	(667)	(4.8)
Artisan Partners	6,496	6,457,443	53%	52%	57%	65%	(2,141)	(3.3)
Pyramis	14,605	6,830,226	54%	53%	59%	70%	(3,555)	(5.2)
Baillie Gifford	95	69,631	56%	52%	94%	86%	(36)	(5.1)
Morgan Stanley	2,891	3,985,923	44%	44%	49%	48%	2,298	5.8
Templeton Investment	2,263	1,739,859	50%	48%	71%	71%	(121)	(0.7)
Sprucegrove	3,693	2,134,842	53%	54%	48%	47%	(693)	(3.2)
Capital Guardian	5,778	3,093,244	52%	53%	49%	53%	(819)	(2.6)
New Star	896	1,775,120	51%	51%	54%	59%	239	1.3
Walter Scott	253	341,157	37%	36%	53%	38%	187	5.5
Mondrian Emerging	3,533	1,599,969	59%	59%	59%	65%	(1,579)	(9.9)
JP Morgan Emerging	1,540	977,154	61%	60%	68%	64%	(752)	(7.7)
Acadian Emerging	3,457	3,058,898	60%	59%	62%	68%	(4,223)	(13.8)
Aberdeen Emerging	1,454	624,005	57%	56%	60%	66%	(767)	(12.3)
Trilogy Emerging	1,717	1,263,681	64%	64%	69%	73%	(1,677)	(13.3)
Aberdeen Frontier Markets	112	29,677	84%	78%	90%	91%	(131)	(44.1)
Halbis Frontier Markets	442	42,608	91%	81%	94%	89%	(173)	(40.6)

Accounts	Trades		% disadvantageous by value				Excess (cost) / benefit	
	Volume in # of trades	Volume in USD (000's)	Total	Market	Non-market	Micro	USD (000's)	Bps of traded value
First State Frontier Markets	439	40,353	61%	48%	73%	57%	(64)	(15.8)
FE Restructure	81	418,543	42%	42%	43%	67%	490	11.7
William Blair	5,400	628,091	88%	87%	88%	88%	(2,381)	(37.9)
Pinebridge Small Cap	5,535	511,361	91%	90%	92%	91%	(1,995)	(39.0)
Dimensional Fund Advisors	489	76,384	48%	41%	56%	46%	23	3.0
Epoch Small Cap	2,199	489,165	69%	60%	72%	81%	(667)	(13.6)
Principal Small Cap	11,520	900,830	45%	46%	45%	45%	295	3.3
Pyramis Small Cap	3,991	555,707	49%	50%	47%	49%	60	1.1
Mondrian Small Cap	1,250	297,517	54%	58%	48%	50%	(102)	(3.4)
Victory Small Cap	4,514	751,088	87%	86%	87%	89%	(2,766)	(36.8)
IE Internal Active	509	309,455	51%	52%	52%	40%	(5)	(0.2)
BGI World ex US	1,178	2,443,536	46%	45%	50%	43%	1,004	4.1
Total	***96,308***	***50,377,952***	***54%***	***52%***	***61%***	***66%***	***(21,578)***	***(4.3)***

Appendix C

Restricted currencies results

Table A2 SBA's "restricted" currencies results

Currencies	Trades		% disadvantageous by value				Excess (cost) / benefit	
	Volume in # of trades	Volume in USD (000's)	Total	Market	Non-market	Micro	USD (000's)	Bps of traded value
Brazilian real (BRL)	2,799	1,240,066	87%	88%	85%	86%	(5,316)	(42.9)
Egyptian pound (EGP)	327	99,624	59%	64%	47%	55%	(58)	(5.8)
Indonesian rupiah (IDR)	683	296,477	47%	48%	43%	51%	(9)	(0.3)
Indian rupee (INR)	961	639,127	63%	64%	56%	56%	(615)	(9.6)
South Korean won (KRW)	3,582	2,492,015	57%	57%	60%	59%	(4,141)	(16.6)
Moroccan dirham (MAD)	26	5,085	100%	100%	100%	100%	(34)	(66.1)
Malaysian ringgit (MYR)	1,151	353,233	69%	69%	68%	72%	(475)	(13.4)

Currencies	Trades		% disadvantageous by value				Excess (cost) / benefit	
	Volume in # of trades	Volume in USD (000's)	Total	Market	Non-market	Micro	USD (000's)	Bps of traded value
Philippine peso (PHP)	328	47,319	86%	79%	88%	94%	(86)	(18.3)
Thai baht (THB)	1,059	412,937	74%	76%	71%	67%	(409)	(9.9)
Taiwan dollar (TWD)	567	1,025,800	67%	67%	66%	79%	(1,113)	(10.8)
Total	***11,483***	***6,611,682***	***66%***	***66%***	***67%***	***70%***	***(12,256)***	***(18.5)***

Appendix D

Imputed spread assumptions

Mercer Sentinel calculates and imputes a spread assumption specific to each currency pair, as described in Appendix A. We do this to adjust for the normal cost of executing in a market so that we can identify the "excess" costs/benefits associated with FX trading. We derive the appropriate spread assumption by analyzing historical spread rates and adjusting where appropriate.

A de minimis portion of SBA's currency pairs did not have sufficient history or data to model an appropriate spread statistically. As a result, 742 executions in our analysis did not have imputed spread assumptions. These executions represented a trade volume of $156 million and realized about $444,000 of excess costs, *assuming no normal spread*. A majority of the securities were secondary and restricted currencies, which generally have a higher cost of executing. Assuming a spread of 8 pips[13] for these 742 executions, the total excess cost decreases to about $334,000. It should be noted that adding this 8 pip spread assumption reduces overall excess costs reported by about $110,000.

The following tables present 1) results for the 742 executions without assumed spreads, by contract type and by year (Tables A3 and A4), and 2) the spreads assumed for each currency pair (Table A5).

[13] "Pips" are the smallest possible increments of price change in currency trading. They generally represent a .0001 change in the currency denomination.

Table A3 Aggregate execution profile by contract type for currency pairs with no spread assumptions only

Contract	Trades		% disadvantageous by value				Excess (cost) / benefit	
By Type	Volume in # of trades	Volume in USD (000's)	Total	Market	Non-market	Micro	USD (000's)	Bps of traded value
C	0	0	0%	0%	0%	0%	0	0
N	0	0	0%	0%	0%	0%	0	0
T	120	30,898	91%	91%	92%	93%	(121)	(39.1)
Non-negotiated	*120*	*30,898*	*91%*	*91%*	*92%*	*93%*	*(121)*	*(39.1)*
L	2	3,895	100%	100%	n/a	n/a	(3)	(8.2)
X	21	15,263	35%	33%	43%	51%	3	2.0
Negotiated	*23*	*19,157*	*48%*	*49%*	*43%*	*51%*	*(0)*	*(0.1)*
I	501	57,150	91%	85%	96%	88%	(287)	(50.2)
Sub-custodian	*501*	*57,150*	*91%*	*85%*	*96%*	*88%*	*(287)*	*(50.2)*
All Internal	***644***	***107,205***	***83%***	***75%***	***91%***	***88%***	***(408)***	***(38.0)***
E	98	48,945	50%	48%	56%	54%	(36)	(7.4)
All External	***98***	***48,945***	***50%***	***48%***	***56%***	***54%***	***(36)***	***(7.4)***
Total	***742***	***156,150***	***73%***	***63%***	***82%***	***87%***	***(444)***	***(28.4)***

Table A4 Aggregate spot execution profile by year, currency pairs with no spread assumptions only

Year[14]	Trades		% disadvantageous by value				Excess (cost) / benefit	
	Volume in # of trades	Volume in USD (000s) (000's)	Total	Market	Non-market	Micro	USD (000's)	Bps of traded value
2005	7	817	98%	n/a	100%	90%	(6)	(78.0)
2006	2	2,363	100%	100%	n/a	100%	(3)	(14.4)
2007	12	3,653	40%	33%	52%	15%	3	7.3
2008	77	49,882	58%	52%	79%	80%	(83)	(16.7)
2009	464	79,506	82%	76%	82%	91%	(293)	(36.8)
2010	180	19,929	77%	61%	93%	78%	(61)	(30.4)
Total	***742***	***156,150***	***73%***	***63%***	***82%***	***87%***	***(444)***	***(28.4)***

Table A5 Imputed spread by currency pair

Currency	Spread	Currency	Spread	Currency	Spread	Currency	Spread
AUDCAD	0.0003	EURGBP	0.0002	JPYGBP	0.0003	SGDAUD	0.0003
AUDCHF	0.0005	EURHKD	0.0003	JPYHKD	0.0003	SGDCAD	0.0005
AUDDKK	0.0003	EURHUF	0.0006	JPYMXN	0.0005	SGDCHF	0.0005
AUDEUR	0.0003	EURJPY	0.0003	JPYNOK	0.0003	SGDDKK	0.0005
AUDGBP	0.0003	EURMXN	0.0005	JPYNZD	0.0003	SGDEUR	0.0005
AUDHKD	0.0003	EURNOK	0.0003	JPYPLN	0.0005	SGDGBP	0.0004
AUDJPY	0.0005	EURNZD	0.0003	JPYSEK	0.0003	SGDHKD	0.0005
AUDMXN	0.0005	EURPLN	0.0005	JPYSGD	0.0003	SGDJPY	0.0003
AUDNOK	0.0003	EURSEK	0.0003	JPYTHB	0.0005	SGDNOK	0.0005

[14] Years 2005 and 2010 are partial years; specifically, 2005 covers from 1 July 2005 and 2010 covers until 31 May 2010.

Currency	Spread	Currency	Spread	Currency	Spread	Currency	Spread
AUDNZD	0.0003	EURSGD	0.0005	JPYTRY	0.0008	SGDPLN	0.0010
AUDPLN	0.0010	EURTHB	0.0005	JPYUSD	0.0003	SGDSEK	0.0005
AUDSEK	0.0005	EURTRY	0.0005	JPYZAR	0.0003	SGDTRY	0.0010
AUDSGD	0.0003	EURTWD	0.0005	KRWGBP	0.0003	SGDUSD	0.0003
AUDTHB	0.0003	EURUSD	0.0003	KRWUSD	0.0003	THBAUD	0.0003
AUDUSD	0.0005	EURZAR	0.0005	LKRUSD	0.0025	THBDKK	0.0008
BRLGBP	0.0015	GBPAUD	0.0003	MXNAUD	0.0005	THBEUR	0.0010
BRLUSD	0.0015	GBPBRL	0.0015	MXNCAD	0.0005	THBGBP	0.0003
CADAUD	0.0003	GBPCAD	0.0003	MXNCHF	0.0010	THBHKD	0.0010
CADCHF	0.0005	GBPCHF	0.0003	MXNEUR	0.0005	THBJPY	0.0005
CADDKK	0.0003	GBPCZK	0.0005	MXNGBP	0.0010	THBUSD	0.0003
CADEUR	0.0003	GBPDKK	0.0003	MXNHKD	0.0010	TRYCHF	0.0010
CADGBP	0.0003	GBPEUR	0.0003	MXNJPY	0.0006	TRYDKK	0.0008
CADHKD	0.0004	GBPHKD	0.0003	MXNTRY	0.0050	TRYEUR	0.0010
CADJPY	0.0003	GBPHUF	0.0005	MXNUSD	0.0003	TRYGBP	0.0010
CADMXN	0.0005	GBPJPY	0.0003	MYRGBP	0.0003	TRYHKD	0.0025
CADNOK	0.0003	GBPKRW	0.0003	MYRUSD	0.0003	TRYJPY	0.0008
CADPLN	0.0005	GBPMXN	0.0005	NOKAUD	0.0003	TRYMXN	0.0050
CADSEK	0.0003	GBPMYR	0.0003	NOKCAD	0.0003	TRYNOK	0.0008
CADSGD	0.0005	GBPNOK	0.0003	NOKCHF	0.0003	TRYSEK	0.0010
CADUSD	0.0003	GBPPLN	0.0006	NOKDKK	0.0003	TRYSGD	0.0010
CHFAUD	0.0005	GBPSEK	0.0003	NOKEUR	0.0003	TRYUSD	0.0010
CHFCAD	0.0005	GBPSGD	0.0003	NOKGBP	0.0003	TWDEUR	0.0015
CHFDKK	0.0003	GBPTHB	0.0005	NOKHKD	0.0006	TWDGBP	0.0015
CHFEUR	0.0003	GBPTRY	0.0006	NOKJPY	0.0003	TWDUSD	0.0003
CHFGBP	0.0003	GBPTWD	0.0005	NOKSEK	0.0003	USDAUD	0.0005

Currency	Spread	Currency	Spread	Currency	Spread	Currency	Spread
CHFHKD	0.0003	GBPUSD	0.0002	NOKSGD	0.0005	USDBRL	0.0015
CHFHUF	0.0008	GBPZAR	0.0005	NOKTRY	0.0010	USDCAD	0.0003
CHFJPY	0.0003	HKDAUD	0.0003	NOKUSD	0.0005	USDCHF	0.0003
CHFMXN	0.0010	HKDCAD	0.0004	NZDAUD	0.0003	USDCZK	0.0005
CHFNOK	0.0003	HKDCHF	0.0003	NZDCHF	0.0005	USDDKK	0.0003
CHFNZD	0.0005	HKDCNY	0.0010	NZDDKK	0.0005	USDEGP	0.0020
CHFSEK	0.0003	HKDDKK	0.0005	NZDEUR	0.0003	USDEUR	0.0003
CHFSGD	0.0005	HKDEUR	0.0003	NZDJPY	0.0005	USDGBP	0.0003
CHFTRY	0.0010	HKDGBP	0.0004	NZDUSD	0.0005	USDHUF	0.0010
CHFUSD	0.0003	HKDHUF	0.0020	PHPUSD	0.0005	USDIDR	0.0020
CNYHKD	0.0003	HKDILS	0.0010	PLNAUD	0.0010	USDILS	0.0020
CZKEUR	0.0006	HKDJPY	0.0005	PLNCAD	0.0005	USDINR	0.0020
CZKGBP	0.0005	HKDMXN	0.0010	PLNEUR	0.0015	USDJPY	0.0003
CZKUSD	0.0005	HKDNOK	0.0003	PLNGBP	0.0015	USDKRW	0.0003
DKKAUD	0.0003	HKDPLN	0.0008	PLNHKD	0.0030	USDLKR	0.0025
DKKCAD	0.0003	HKDSEK	0.0006	PLNJPY	0.0010	USDMXN	0.0003
DKKCHF	0.0003	HKDSGD	0.0003	PLNSEK	0.0008	USDMYR	0.0003
DKKEUR	0.0003	HKDTHB	0.0005	PLNSGD	0.0010	USDNOK	0.0005
DKKGBP	0.0003	HKDTRY	0.0006	PLNUSD	0.0015	USDNZD	0.0005
DKKHKD	0.0005	HKDZAR	0.0010	RUBUSD	0.0008	USDPHP	0.0005
DKKJPY	0.0003	HUFCHF	0.0008	SEKAUD	0.0005	USDPLN	0.0015
DKKNOK	0.0003	HUFEUR	0.0006	SEKCAD	0.0003	USDRUB	0.0008
DKKNZD	0.0005	HUFGBP	0.0005	SEKCHF	0.0003	USDSEK	0.0003
DKKSEK	0.0003	HUFHKD	0.0020	SEKDKK	0.0003	USDSGD	0.0003
DKKSGD	0.0005	HUFUSD	0.0010	SEKEUR	0.0003	USDTHB	0.0003
DKKTHB	0.0006	IDRUSD	0.0020	SEKGBP	0.0003	USDTRY	0.0010

Currency	Spread	Currency	Spread	Currency	Spread	Currency	Spread
DKKTRY	0.0006	ILSHKD	0.0030	SEKHKD	0.0005	USDTWD	0.0003
DKKUSD	0.0003	ILSUSD	0.0020	SEKJPY	0.0005	USDZAR	0.0003
EGPUSD	0.0020	INRUSD	0.0020	SEKNOK	0.0003	ZAREUR	0.0004
EURAUD	0.0003	JPYAUD	0.0005	SEKPLN	0.0008	ZARGBP	0.0004
EURCAD	0.0003	JPYCAD	0.0003	SEKSGD	0.0005	ZARHKD	0.0010
EURCHF	0.0003	JPYCHF	0.0003	SEKTRY	0.0010	ZARJPY	0.0003
EURCZK	0.0006	JPYDKK	0.0003	SEKUSD	0.0003	ZARUSD	0.0003
EURDKK	0.0003	JPYEUR	0.0003				

Table A6 Currency pairs without imputed spreads

Currency	Spread	Currency	Spread	Currency	Spread	Currency	Spread
AEDUSD	0.0000	GHSUSD	0.0000	NOKMXN	0.0000	TWDCAD	0.0000
ARSUSD	0.0000	HKDCZK	0.0000	NOKPLN	0.0000	TWDZAR	0.0000
AUDZAR	0.0000	HKDUSD	0.0000	NOKZAR	0.0000	USDAED	0.0000
BRLEUR	0.0000	HRKUSD	0.0000	NZDCAD	0.0000	USDARS	0.0000
BWPUSD	0.0000	HUFCAD	0.0000	NZDMXN	0.0000	USDBWP	0.0000
CADCZK	0.0000	HUFDKK	0.0000	NZDPLN	0.0000	USDCLP	0.0000
CADHUF	0.0000	HUFJPY	0.0000	OMRUSD	0.0000	USDCOP	0.0000
CADMYR	0.0000	HUFNOK	0.0000	PKRUSD	0.0000	USDEEK	0.0000
CADNZD	0.0000	HUFPLN	0.0000	PLNCHF	0.0000	USDGHS	0.0000
CADTRY	0.0000	HUFSEK	0.0000	PLNCZK	0.0000	USDHKD	0.0000
CADTWD	0.0000	HUFSGD	0.0000	PLNHUF	0.0000	USDHRK	0.0000
CADZAR	0.0000	ILSMXN	0.0000	PLNMXN	0.0000	USDJOD	0.0000
CHFCZK	0.0000	ILSTRY	0.0000	PLNNOK	0.0000	USDKES	0.0000
CHFPLN	0.0000	INREUR	0.0000	PLNNZD	0.0000	USDMAD	0.0000

Currency	Spread	Currency	Spread	Currency	Spread	Currency	Spread
CLPUSD	0.0000	JODUSD	0.0000	PLNTRY	0.0000	USDMUR	0.0000
COPUSD	0.0000	JPYCZK	0.0000	PLNZAR	0.0000	USDNGN	0.0000
CZKCAD	0.0000	JPYHUF	0.0000	QARUSD	0.0000	USDOMR	0.0000
CZKCHF	0.0000	KESUSD	0.0000	RONUSD	0.0000	USDPKR	0.0000
CZKDKK	0.0000	KRWEUR	0.0000	SEKHUF	0.0000	USDQAR	0.0000
CZKHKD	0.0000	MADUSD	0.0000	SEKMXN	0.0000	USDRON	0.0000
CZKJPY	0.0000	MURUSD	0.0000	SEKTHB	0.0000	USDTND	0.0000
CZKMXN	0.0000	MXNCZK	0.0000	SEKZAR	0.0000	USDZMK	0.0000
CZKNOK	0.0000	MXNDKK	0.0000	SGDCZK	0.0000	ZARAUD	0.0000
CZKPLN	0.0000	MXNILS	0.0000	SGDHUF	0.0000	ZARCAD	0.0000
CZKSGD	0.0000	MXNNOK	0.0000	SGDMXN	0.0000	ZARCZK	0.0000
CZKTRY	0.0000	MXNNZD	0.0000	SGDZAR	0.0000	ZARMXN	0.0000
CZKZAR	0.0000	MXNPLN	0.0000	THBSEK	0.0000	ZARNOK	0.0000
DKKCZK	0.0000	MXNSEK	0.0000	TNDUSD	0.0000	ZARPLN	0.0000
DKKHUF	0.0000	MXNSGD	0.0000	TRYCAD	0.0000	ZARSEK	0.0000
DKKMXN	0.0000	MXNZAR	0.0000	TRYCZK	0.0000	ZARSGD	0.0000
EEKUSD	0.0000	MYRCAD	0.0000	TRYILS	0.0000	ZARTRY	0.0000
EURBRL	0.0000	NGNUSD	0.0000	TRYPLN	0.0000	ZARTWD	0.0000
EURINR	0.0000	NOKCZK	0.0000	TRYZAR	0.0000	ZMKUSD	0.0000
EURKRW	0.0000	NOKHUF	0.0000				

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